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PROLIFERATION OF DIFFERENT BUILDING PROCUREMENT SYSTEMS AND THEIR APPROPRIATE APPLICATION: A CASE OF TANZANIA

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CERTIFICATION

The undersigned, certifies that he has read and hereby recommend for acceptance by the University of Cape Town a thesis titled: *Proliferation of Different Building Procurement Systems and their Appropriate Application: A case of Tanzania*, in fulfillment of the requirements for the Masters Degree of Construction Economics and Management (Faculty of Engineering and the Built Environment)

.....

R.D. (Bob) Hindle

.....

Date

DEDICATION

To my daughter Doris, my son Denis
and my beloved wife Editha

DECLARATION

I, Adonis Mwijage Kamala, hereby declare that the contents of this thesis are the result of my own findings, and to the best of my knowledge, they have never been presented to any other University for similar or any other degree award.

Signature removed

30th June, 2000

Date

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ABSTRACT

The term "Building Procurement System" has become a fashionable term within the Tanzanian building industry in recent years. It is a term that is surrounded by controversy and evokes strongly held opinions by both practitioners and researchers. This thesis attempts to analyse what these procurement systems have to offer and to match them to the objectives of the client and characteristics of the project.

Three hypotheses are explored in this thesis. Firstly, that the Traditional Building Procurement System has fallen from favour due to its frequent failure to deliver in terms of time, cost and quality. Secondly, that the new Building Procurement Systems are inappropriately applied to building projects, due to the consultant's inexperience with certain new systems. The third hypothesis is that clients are satisfied with the results of the new Building Procurement Systems.

Through the research process four objectives were pursued. The first is the way that the construction industry performance is measured and what has caused the development of new Building Procurement System. The second is the review of Building Procurement Systems theory focusing on their meaning and categorisation. Thirdly is the selection of Building Procurement Systems, that is, the relationship between client's objectives, project characteristics and the characteristics of the procurement systems.

Data was gathered through the use of the following methods:

- Case studies investigating approaches to the selection of Building Procurement Systems
- Questionnaires to consultants on their knowledge and experience with various Building Procurement Systems
- Questionnaires to clients on their objectives for building projects and their satisfaction on the results of various Building Procurement System used.

The data collected are analysed and the main results are reported in chapters five and six.

The primary conclusion that is drawn is that Building Procurement Systems are inappropriately applied to building projects in Tanzania. This is due to the consultants' inexperience with certain new systems, often resulting in cases where the Traditional Building Procurement System has been recommended because it was the only with which the architect was familiar, thus it was used as a "default system". It was found that there is a need for a model which would allow clients and their consultants or contractors to select the most appropriate procurement system as a way towards successful projects implementation in the Tanzanian building industry.

Finally, recommendations are made, concerning the appropriate selection and use of Building Procurement Systems.

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LIST OF ABBREVIATIONS

AAT - Architectural Association of Tanzania

BPF - British Property Federation

BPS - Building Procurement Systems

BOT - Build Operate Transfer

BOOT - Build Own Operate Transfer

CM - Construction Management

DB - Design and Build

DC - Develop and Construct

DM - Design and Manage

ELSIE - A computer based selection system developed by Royal Institute of Chartered Surveyers.

ILO - International Labour Organisation

MC - Management Contraction

MECCO - Mwananchi Engineering & Contracting Company

NEDO - National Economic Development Office

NEDCO - National Estates & Design Corporation

NCC - National Construction Council

NHC - National Housing Corporation

PAC - Procurement Assessment Criteria

PD - Package Deal

PM - Project Management

PPF - Parastatal Pensions Fund

RIBA - Royal Institute of British Architects

TBPS - Traditional Building Procurement System

TIQS - Tanzania Institute of Quantity Surveyors

TSHS - Tanzanian Shillings (currency)

USA - United States of America

USD - United States Dollar (currency)

UK - United Kingdom

LIST OF APPENDICES

CHAPTER ONE

THE PROBLEM AND ITS SETTING

1.1 MEANING OF THE TERM BUILDING PROCUREMENT SYSTEM (BPS)

The term 'Building Procurement Systems' was defined by Franks (1984), after examining two key words, that is, *"building"* and *"procurement"*. He suggested that when conjoined they relate to the method or organizational structure used to acquire a product, in this case a new building. Franks (1987,1990), revisited his definition of building procurement system and came up with this phrase; *"the amalgam of activities undertaken by a client to obtain a building"*.

The NEDO (1988), report described Building Procurement Systems as the manner in which Clients buy from building industry the specialist activities and resources needed to create a new building. It implies the relationships between those involved and the responsibilities of individual participants.

Mohsini and Davidson (1991) defined *"procurement"* as a process term which refers to the acquisition of new buildings or space within buildings either by directly buying, renting or leasing from the open market, or by designing and building the facilities to meet a specific need.

Turner (1990), explained that a building is something built with a roof and walls and procurement as the act of obtaining, acquiring or securing something. The term *"procure"* was further defined by Kumaraswamy and Dissanayaka (1996), as to *"procure"* and thus *"procurement"* as the action or process of acquiring or obtaining materials, property or services at the operational level. Notwithstanding, McDermott and Jaggar (1996) cited Hibberd definition of the term procurement as offered by the Oxford English dictionary, *"the act of obtaining by care or effort, acquiring or bringing about"*

However, a working definition of the term procurement which was suggested by Sheath, Jaggar and Hibberd (1993), and supported by McDermott and Jaggar (1996), is that developed by CIB W92 at its commission meeting in 1991.

That was *"... the framework within which construction is brought about, acquired or obtained"*. Mohsini, Sirpal and Davidson (1995), attempted a more sophisticated definition of the Building Procurement system. They stated BPS as, *"... the acquisition of new buildings, or space within buildings, either by direct buying, renting or leasing from the open market, or by designing and building facility to meet a specific need"*.

According to Root and Hancock (1996), Building Procurement Systems is the strategies adopted by building clients to acquire building projects. In other words, the project organizational structure, which is the collective action required to acquire the design, management and installation inputs is referred to as a procurement system (Rwelamila and Ngowi, 1996). It assigns specific responsibilities and authorities to people and organisations, and defines the relationship of the various elements in the construction of a project (Love, Skitmore and Earl, 1998). Building Procurement System definition adopted in this dissertation is, therefore, a sequence of actions and the route taken by the customer in obtaining a structure that has a roof and walls, which is a building.

1.2 CHARACTERISTICS OF THE TRADITIONAL BUILDING PROCUREMENT SYSTEMS (TBPS)

> *In no other important industry is the responsibility for design so far removed from the responsibility for production.* Emerson in Franks (1984, 1987, 1990).

Franks (1984, 1987, 1990) gave out seventeen characteristics of the TBPS. He explained that, the traditional form of contracting is where the client appoints consultants to produce design and other documents and to supervise the contractor to carry out the work through to completion. However, probably the most important of these is the fact that design should be completed before construction starts. All of the TBPS characteristics are shown on figure 1.1 below.

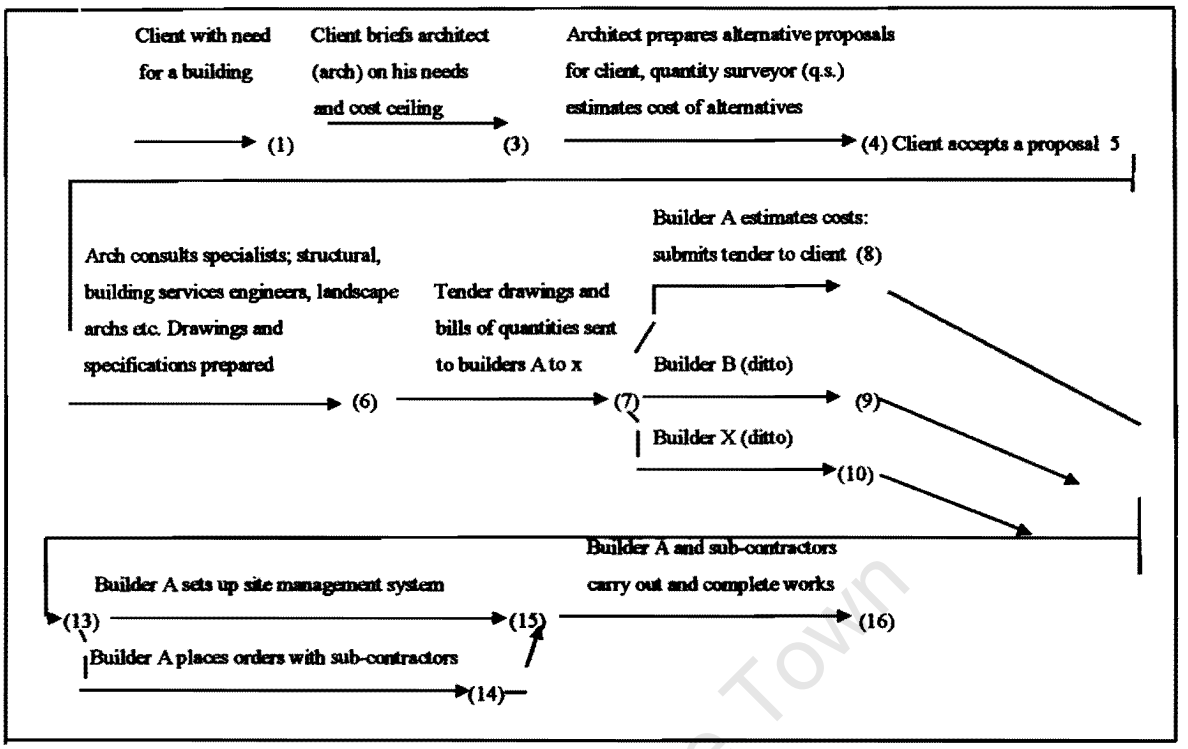

Fig 1.1 The " traditional " procurement system (Franks, 1990)

In the traditional system, writes Turner (1990), the client appoints consultants for design and for cost control, then generally after the design has been taken to any one of a number of stages, a main contractor is appointed to carry out the construction work. Masterman (1992), explained that the TBPS is where the responsibility for both design and construction aspects of the project are the responsibility of separate organizations. According to Rwelamila and Ngowi (1996), the essence of the TBPS is that there is a separate contract entered between the client and the designers (architects, engineers and quantity surveyors) and later, a separate contract between the client and the builder (contractor). In other words, the designer designs and the builder builds.

1.3 BUILDING PROCUREMENT SYSTEMS IN TANZANIA

Unfortunately, none of the many reports on the building industry that has been produced since the mid - 1960s by the government sponsored committee and others, have accurately and/or adequately defined the level of use by different clients of the various available procurement systems.

According to Nkinga (1995), the public sector procurement procedure (not limited to buildings) is embodied in Section 143 of the constitution of the United Republic of Tanzania.

According to Wells (1986), at the time of achieving political independence, Tanzania, under the British mandate had a Ministry of Public Works which was responsible for overseeing the implementation of all government building programs. In principle, clarified Wells (1986), all building plans for new construction projects should first be approved by Ministry of Planning.

All commissions for building projects should be channeled to NEDCO for design and then MECCO for construction through the Ministry of Works. Since the design responsibility (by NEDCO) was separated from construction responsibility (by MECCO) - the main characteristic of the TBPS and that of building works in the public sector accounted for 70 per cent of the total country building projects (ILO report 1983), then there is enough justification that in Tanzania the TBPS dominated the building industry in the past

At the time of achieving political independence in 1961 the building industry in Tanzania was based upon the British model in which by the TBPS was predominant. According to Hindle (1996), even in South Africa, as in most of the other Commonwealth Countries, the building industry has been structured around the same British model. The works of Cattell, Hindle and Rogalli (1996), attributed this resemblance largely as the result of the introduction of British systems to respective countries by immigrant professionals to look for greener pasture from around the turn of the century.

1.4 PROBLEM STATEMENT

There is an apparent change in the use of Building Procurement Systems taking place because the Traditional Building Procurement system (TBPS) is not suitable for most Clients in Tanzania.

1.4.1 **Sub - Problem 1**

Is that the Traditional Building Procurement System (TBPS) is inapropriate for certain clients?

1.4.2 **Sub - Problem II**

Are the new Building Procurement Systems (BPS) more suitable for the projects for which they are being applied?

1.4.3 **Sub - Problem III**

Are clients satisfied with the results of the new Building Procurement Systems (BPS)?

1.5 RELEVANCE OF THE STUDY

"Building Procurement Systems" has become a fashionable term with industry practitioners and researchers. In principle it determines the overall framework of responsibilities and authorities for participants within the building process. It is a key factor contributing to overall client satisfaction and project success. The selection of the most suitable procurement method consequently is critical for both clients and project participants, and is becoming an important and contemporary issue within the building industry.

The problem, nevertheless, lies in the fact there has been limited empirical research in this field of study. To date, there has been no investigation in Tanzania which has specifically analyzed the characteristics of the client and the project within the scope of one study and related them to alternative building procurement systems available. To this end nobody is aware of the suitability of each procurement option for a range of building projects that may need to be implemented.

1.6 OBJECTIVE OF THE STUDY

In view of the stated problems, specific objectives of the study are:-

(a) to investigate the type and extent of the application of different Building Procurement Systems in the building industry in Tanzania.

(b) to establish reasons which led the Traditional Building Procurement System (TBPS) to fall from favour.

(c) to assess the suitability of the new Building Procurement System (BPS) with respect to project characteristics of the case studies.

(d) to assess the satisfaction of the client with the results of the new systems.

(e) to discover the limits of the consultant's knowledge about the various types of Building Procurement Systems (BPS) available.

1.7 RESEARCH HYPOTHESES

The research seeks to confirm three central hypotheses:

1.7.1 Hypothesis I

The Traditional Building Procurement System has fallen from favour because of its frequent failure to deliver in terms of time, cost and quality.

1.7.2 Hypothesis II

The new Building Procurement Systems are inappropriately applied on projects due to the lead consultants' inexperience with certain new systems.

1.7.3 Hypothesis III

Clients are satisfied with the results of the new Building Procurement Systems (BPS).

1.8 SCOPE AND LIMITATIONS OF THE RESEARCH

This research was carried out within the confines of the following limitations.

1.8.1 Time

Projects carried out from early 1990s to date were concentrated on. The reason for this being that this period cuts a cross - section through various social-economical changes which have taken place in Tanzania. For instance, it is within this period that the private sector has replaced the taxpayer as the major client of the building sector. It is therefore to be expected that the private sector would subject the procurement of their buildings to the same scrutiny as the rest of their business.

1.8.2 Geographical Area

The geographical boundaries of the research were within Tanzania and particularly within Dar es Salaam and Arusha. This was necessitated by the limited resources available to carry out the research on a wider geographical area and the fact that the majority of projects carried out in other parts of the country have been financed and / or supervised by clients and consultants based in Dar es Salaam and executed within the above mentioned cities, for instance, of the 34 registered architectural firms, 33 are based in Dar es Salaam.

1.8.3 Client Groups

The research was restricted only to clients with formal building projects. The informal building sector was excluded to increase the reliability of the information and ease the data collection. However, the formal building industry covers both the private and public sector.

1.8.4 Statistical Sampling

The method of data sampling was random especially primary statistics. Primary data was to be obtained from interview and questionnaires. The source of secondary data would be available in reports, papers and other publications. The findings and conclusion arrived at are only accurate to the extent that the primary and secondary data sources are reliable and accurate.

1.9 RESEARCH METHODOLOGY

Any research involves gathering information from a number of sources, comperative results, drawing of conclusion and making appropriate recommendations. Therefore, the methodology adopted in the collection and compilation of relevant basic data for this research is as follows:-

1.9.1 Literature review

The review of literature is to establish a theoretical base of the existence of various subject matters. This is achieved through reviewing books journals and research papers. In this step of literature review three chapters are presented which are now briefly described.

Chapter Two: Construction industry performance has its strong linkage to Building Procurement Systems. Any force of change to improve performance of construction industry may, in one way or another, necessitate changes in the Building Procurement Systems. This chapter reviews the world history of construction industry performance and tracings evolvement of forces of change in the Building Procurement System. The review commences with broad cross – sectional readings and narrow down to the Tanzanian context.

Chapter Three: This chapter provides a basis understanding of various Building Procurement Systems. Based on the available literature various definitions and approaches used to categorise Building Procurement Systems are presented in this chapter.

Chapter Four: Based on Building Procurement Systems theories reviewed in Chapter three, this chapter describeds the various ways that may be used in the selection of appropriate system. It reviews various categories of clients, their needs and approaches that may be used to select a system likely to fulfill their expectations.

1.9.2 Case studies

This is one of the qualitative research applications. By using this methodology, the researcher assumes an interactive role with other participant and become personally involved with the people and phenomenon being studies. The results of case studies and interviews are presented in chapter five. They form the basis of synthesizing the findings and arguments presented in chapter six.

1.9.3 Questionnaires

This is a good way of collecting certain types of information quickly and relatively cheaply. As a research tool, a questionnaire is subject to various kind of limitations from several sources (social desirability, anonymity and educational differentials). These limitations were considered during questionnaire design. Respondent were given option to state their names and they were assured that the results of the survey were to be used in aggregate form. Questionnaire had three types of questions:-

Open-ended questions: Respondents were given opportunity to provide their own answers and views to the questions. These questions were included because the author did not anticipate probable replies from respondents on certain issues. Secondly, these questions were included in order to provide insights, side comments, and explanation in order to develop a "feel" for research findings on various aspects of the study.

Multiple – choice questions: Respondents were given an opportunity to choose an answer from, among a list provided in the question, proper of following the question.

Dichotomous questions: These are extreme forms of multiple – choice questions which allow the respondent only two responses, such as yes-no or agree – disagree.

1.9.4 Interviews

This is used to supplement the questionnaire approach to get hold of the targetted group who will not respond to the questionnaire. Also this is used to interpret the questionnaire, to ensure proper understanding by respondents and to assess the quality of answers provided.

The decision was made that the interviews would be conducted in a "laboratory type setting" which is a well established research method in the field of counselling psychology. A structured interview document (Appendix IV) was used with the primary purpose of maintaining uniformity in terms of the main issues of the study.

1.9.5 Data analysis

The technique applied and presented to client as a guide for selection of appropriate Building Procurement System is the one provided by NEDO (1985). The NEDO selection technique utilises nine criteria. Each critetia (or priorities) are presented in a question format with two or three multiple choice answers. Once a "choice" has been made, all dots on that row of the corresponding chart are ringed. This procedure is repeated for each of the criteria in turn. Upon completion the number of ringed dots in each column are summed and these totals will indicate which procurement system is suitable. This then is compared with the procurement system used in each case study to establish appropriateness of the system (refer table 5 on page 135).

Based on the findings of case studies, interviews and consultants surveys, a systhesis of these findings and arguments is presented in chapter five and six. Views of different main players from case studies are compared and taken through to prove or disaprove hypothesis generated in this chapter.

CHAPTER TWO

CONSTRUCTION INDUSTRY PERFORMANCE AND CHANGES IN THE BUILDING PROCUREMENT SYSTEMS

2.1 INTRODUCTION

This part of the literature review focuses on the construction industry performance with respect to procurement changes and customer satisfaction. Previous studies have generally indicated that the performance of the construction industry can be pegged against the three parameters of time, cost and quality. Coincidentally, studies analyzing customer's needs on construction projects have indicated similar parameters influencing customer's satisfaction. Furthermore, they constitute determinants for choosing the appropriate procurement strategy applicable for any project.

The review commences with broad cross - sectional readings that narrow, much like an inverted pyramid with its broad end on top. Discussion in the first part of the related literature will focus on the performance of the construction industry globally, in relation to customer satisfaction and the essence of changes in procurement systems.

Most of the literature available is related to the U.K construction industry but this information is useful because construction industries found in most Commonwealth countries are structured around the British model. Problems experienced in U.K have a great impact on the construction industries of the Commonwealth Countries. Nonetheless, literature on the situation in Australia, Canada and USA is also accommodated to give the analysis a global outlook.

The second part of the related literature review is centred on the context of developing countries. Discussion will generally focus on construction industry performance and customer satisfaction in these countries. This will highlight the procurement problems found in developing countries other than Tanzania which could give way to some acceptable procurement changes relevant to the case study. The literature of countries like Botswana, Ghana, Kenya, Nigeria, South Africa and Sri Lanka will be critically analysed. The last part of this chapter will discuss relevant issues pertaining to the performance of the construction industry in Tanzania.

2.2 GLOBAL CONSTRUCTION INDUSTRY PERFORMANCE CRITERIA

The effects of time, cost and quality management on the construction project are generally considered as appropriate parameters for measuring the performance of individual projects and the construction industry as whole. According to Naoum (1989), the construction industry performance, or rather project performance, calls for the optimization of the combination of time, cost and quality. In this respect, project time implies project execution speed and the overall period taken from inception to completion; cost means the final cost paid per square metre of building in relation to the budget; and quality implies the standard of design and construction that the product has attained.

A construction project may, therefore, be regarded as successful if it satisfies the client's expectations. The same construction project achieves client satisfaction if it is delivered at the right time, at an appropriate cost and with quality standards (Root and Hancock, 1996). Rwelamila and Ngowi (1996), added utility (achievement of functional requirement) to cost, time and quality and identified them as client's principal objectives in any building project. They emphasized that an attempt by any project organization structure to attain a high level of client satisfaction should be measured on the basis of success or failure of keeping those parameters within acceptable/optimum limits.

Furthermore, Songer, Molenaar and Robinson (1996) studied the selection factors and success criteria of Design and Build delivery system in the USA and UK and concluded that owners judge a project's success on the basis of cost variance from the budget, time over-run and quality conformity expectations. Notwithstanding, Walker (1996), in his study on the Australian construction industry identified time, along with cost and quality, as being three crucial success factors for construction project performance. His focus on construction time resulted in his conclusion that this parameter was directly affected by managerial performance. He singled out communication effectiveness of the design team and client representatives as one of the bottlenecks of effective construction time management.

According to Anttila, Laine and Syrja (1999) the customer satisfaction indicator, among other standards, is a tool for company management to forecast future business and to improve company activities. Customer satisfaction information enables the company to develop its activities to increase the value added for customers.

2.3 CONSTRUCTION PERFORMANCE AND PROCUREMENT SYSTEMS

Kumaraswamy and Dissanayaka (1996), in their analysis of the 1994 Lathan Report on the U.K. construction industry, linked the poor management of time, cost and quality (which predominantly affects the performance of the construction industry) with the applicable procurement systems. They further observed that claims and disputes of which the main source are poor time, cost and quality management are closely related to the procurement systems.

Thus they argue that the selection of the appropriate procurement strategy by the clients or their representatives is paramount if the optimal solution in terms of cost, time and quality performance are to be achieved. This is in line with the argument by Turner (1989) that appropriate choice of procurement systems streamlines roles and responsibilities of different participants at various stages of the construction process.

This fact is further supported by Bowen, Hindle and Pearl (1996) who established that the inappropriate choice of a procurement system is one of the principal reasons for poor performance in the construction industry. There are researchers who were trying to study the performance of the global construction industry by focusing their attention on particular aspects such as specific organizational structure of say Design and Build. For instance, Walker (1996) was trying to study the performance of a construction management team.

He was of the opinion that the procurement method is not a significant factor affecting construction industry performance but rather the way in which teams interact. Unfortunately, these researchers have reached diverse conclusions regarding the teams' interactions potential impact on performances.

However, other researchers and analysts who considered procurement systems in totality have, in general, confirmed the potential impact of the systems on the construction industry performance levels (Kumaraswamy and Dissanayaka 1996).

2.4 ESSENCE OF PROCUREMENT CHANGES

According to Bowley (1966), the separation of the design responsibility from construction responsibility caused builders to neglect their own education and advancement on design, or avoid the employment of designers, and at the other end, lead architects to neglect their own education in construction practice. Slowly, project managers have taken the principal agent's role previously entrusted to the architects (Powell, 1988). Masterman (1992), writes that the majority of construction projects in Britain prior to the Second World War (1939-1945), were implemented by conventional (traditional) methods of procurement which remained unchanged for over 150 years. Although in the 1950s and 60s Masteman (1992) observed that other procurement forms such as negotiated and serial contracts were being used, the use of the TBPS was still predominant, mainly as a result of central and local government controlling the major part of the industry's annual workload and maintaining a policy of public accountability.

Howes (1993) was of the opinion that, the set up of the TBPS easily resulted in the parties concerned taking up adversarial positions which could in turn led to claims and conflicts being the norm rather than an exception. He (Howes, (1993) also explained that the system was exploited to lengthen the contract period where this suited the contractor , gave no effective guarantee of quality and could, in the end, cost the client more than he should be paying. Hindle (1993), asserted that the TBPS has been held in place by the public sector who use the competitive bid method of contractor selection for accountability reasons rather than its suitability to those building projects. He gave examples of life insurance and pension schemes institutions in South Africa, who are frequent buyers of buildings, and who are not happy with the traditional system and performance of the industry in general resulting from the use of the system.

According to Hibbert (1993), a new profession of project managers with their new Building Procurement Systems have demonstrated a high level of ability to manage both people and systems, to ensure the successful outcome of a project.

They encourage the client to partake in the decision making throughout both the design and construction process of their building projects. This feeling of greater involvement and greater responsibility for the project, at the end, contributed to the Client's satisfaction with respect to the finished product. Howes (1995) shared similar observation with that of Hibbert (1993) that this new and emerging category of a professional is taking a more active and acceptable role. It can manage the building process and it carefully co-ordinates the systems to ensure the effective interface of the various works.

According Boudjabeur (1995), the TBPS is the most popular system in the building industry in the world and is the most highly criticized in terms of its poor construction delivery system. Despite its dominance and popularity in the building industry the TBPS has been criticized as a poor construction delivery system hence causing a decline of construction industry performance. The separation of design from construction has been singled out to be the main source of poor construction industry performance. This is inherent to the TBPS (Mohsini,Sirpal and Davidson,1995), According to Mohsini *et al* (1995) the traditional experience based on the compensation mechanism can no longer be taken for granted in meeting client's perceptions. The current conventional process is certainly not conducive and the result of this is that the project invariably costs more, and a relatively inferior product is delivered as quality is not attainable in these conditions (Howes,1995).

As pointed out earlier in this study Mohsini, *et al* (1995) also noted that another cause of decline of construction industry performance resulted from the inter-organizational conflicts among the participants. In one of their studies carried out in Canada and another in Italy they found that participant conflicts affected the project performance by 70 per cent in terms of time, cost and quality.

According to Rwelamila and Ngowi (1996) the TBPS originated in 1870 when Cubitt in London, the United Kingdom, first began to offer the services of a general contractor. There are a good number of procurement systems applicable to the construction industry. While most of the procurement systems are new and their impact is yet to be substantially felt, the TBPS is the oldest of all procurement forms (Root and Hancock, 1996). Gidado and Barter (1996), critically analyzed the TPBS from a different perspective of flow of information between the two camps of design and construction teams. They noted that the construction industry seems to suffer from a general inability to manage the design information properly. In their analysis they realized that the main problem is that of lack of understanding and poor communication between design and construction teams.

It was revealed that under the TBPS information is often not delivered from the design team at the right time or in the right form to the contractor. This in the end, distorts the project time, cost and quality objectives. Since client's priorities, in terms of time, cost and quality, may not be adequately met by the conventional method, there is a perception that new procurement methods have a clear advantage over the traditional form (Root and Hancock, 1996). On the other hand Rwelamila and Ngowi (1996), criticized TBPS for not adequately reflecting an appropriate and good relationship between the Client, Consultant and the Contractor. They noted that the TBPS has been used merely because consultants failed to consider the issue of appropriateness in terms of client's demands and project characteristics. Not only that, but the professionals, and particularly the architects, have been resisting changes by shunning other conventional business approaches in order to avoid competition and defend their hierarchical position during the executions of building projects(Ndekugri and Turner, 1996).This was possible in the past because of architects, engineers and quantity surveyors entrenchment in a position which was protected by statute (Hindle, 1996). Rwelamila and Ngowi (1996) were of the opinion that the TBPS is basically being used as a "default system". The exclusion of the builder from the design role was further criticized by Walker (1997) when he went through the characteristics of the TBPS and noted that it tends to set the constructor in a lower position of authority with respect to the design team.

According to Bowen, *et al* (1996), clients are prepared to experiment with new innovative procurement systems in order to attain satisfaction from their varied objectives.

This is because the traditional procedure fails to meet their expectations. The new breed of managers in the construction industry have taken the advantage of the gap created by the TBPS. Emmit (1996) explains that the failure of the TBPS could be as the result of architectural education. He went on to write that architects are not being taught to build, but only to design. Therefore the adoption of site production by the architect is a new and probably the most difficult direction for them to take in the execution of the profit.

From the above, it is evident that the construction industry has experienced alternative building procurement systems (BPS) other than the TBPS. These are being offered by a new profession of project managers and enterprising contractors. To be able to understand this proliferation, a critical analysis of the force of changes has to be undertaken . The following seem to be core reasons for changes:-

2.4.1 Economic Changes

The traditional form of procurement dominated the building industry before the Second World War of 1939-1945 (Masterman, 1992; Root and Hancock, 1996; Rwelamila and Ngowi, 1996).

According to Naoum (1989), the separation of design from construction, lack of integration, poor communication, uncertainty in prices, changing environment and increasing project complexity together with economic changes such as inflation and recession, led construction professionals and the industry to offer alternative methods of procurement. He added that, therefore, such forms as management contracting, design and build, and project management came into practice as the result of the above parameters.

Hindle (1993), was of the opinion that that the massive oil price increases of 1973/4 imposed impossible loads on the economies of most countries. The result of this crisis was rampant inflation. To this end, construction industry clients and their advisors came to realize that for many projects, completion time was the priority. Alternative ways of procuring buildings more quickly were, therefore, looked into.

Further to the oil crisis, Hillebrandt and Cannon (1990) observed that to non-oil producing countries, domestic recession was brought about by a fall in demand from the private sector while the level of orders from the public sector also declined. Therefore, consultants and contractors became fully aware that the only means to overcome their unfavourable prospects was to strengthen their marketing efforts considerably.

On the other hand, Hillebrandt and Cannon (1990), suggested that the oil crisis opened up the Middle East markets in the 1970s. Therefore, those companies determined to take these opportunities in the Middle East had to tailor their marketing approach to the scale of private funds available, as well as to the scale and glamour of some of the projects. Another force for change related to economic pressure as the result of the oil crisis was seen by Hindle (1993) to be created by stiff competition for customers as the result of the low demand. Contractors were forced to find new ways of selling their services and products to customers, hence adopting "construction marketing systems" (Hindle and Rwelamila,1993). This was as important to contractors as it had been to the consultants who had to market their services efficiently or perish (Hindle,1993).

Hindle and Rwelamila (1993) when analysing the work of Frank (1990) found that the oil crisis of the mid-seventies which created a double digit inflation world-wide which spurred changes in the BPS. They were of the opinion that those changes were intended to reduce the time between the customer's decision to build and the completion of the building. Therefore, solutions had to be found for problems associated with the building delivery process.

2.4.2 Information Technology

According to Powell (1988), the project management procurement system came about as a result of two major factors; shortcomings on the part of the traditional consultants and growth of the computer technology for swift manipulation of data. Therefore, one of the inevitable results of the information technology age is the acceleration in the exchange of ideas and methods . This has lead to the development of improved delivery systems in the construction industry (Hindle,1993).

According to Hindle (1993), in Japan one of the motor vehicle manufacturers is already producing houses within hours. He revealed that customers are able to see a finished product by means of a computer model. Customers can instantly choose doors, windows, wall positions and quality of finishes from the programme. At the end, these are captured on the program and converted into resource scheduling within seconds. Mohsini *et al* (1995) identified one of the major differences between the TBPS and other procurement forms is the exploitation of information technology as a resource in the construction industry.

Marsden (1996), explained that the design, documentation and construction of a building requires the application and transfer of a vast amount of knowledge and information by a heterogeneous group of consultants, companies, authorities and individuals communicating at various levels. Consequently, the building industry appears to be an industry that has greatly changed through the introduction of information technology.

2.4.3 Education for Builders

Powell (1988), an architect, violently opposes the idea that project managers take a principal agent's role without the necessary expertise. However, the product of tertiary education programs, is producing "professional builders" who are equipped with business skills. With the inherent dissatisfaction of the traditional structure and procedures of the industry, the new generation of builders are leading construction companies to develop innovative construction marketing strategies and systems.

According to Hindle and Rwelamila (1993) the downfall of the TBPS at the expense of other hybrid systems was the result of a lack of an innovative construction marketing system. The TBPS placed the contractor in a passive role. They related the TBPS to the method by which consumable goods are sold when they are simply placed on a shelf awaiting a customer who may choose from a variety of products. They, therefore, found that builders are being educated in the changes to the delivery systems.

Hindle (1996) observed that professional builders who have discovered tried and tested business systems could work in construction. These systems are based upon sound business practice, offer improved customer satisfaction and allow them to get closer to customers. In this approach professional builders are leading the way and leaving the behind conventional professionals.

Furthermore, Hindle and Muller (1997) found that, apart from the tertiary education, the formation of the Institute of Building in U.K pursued separate development. It was supporting continuing education programs to its members. This prepared builders to interface with consultants and clients on equal terms. To this end, the original intention has already been surpassed because according to the above authors, professional managers in construction are not only able to compete as equals but as leaders in the construction delivery process.

2.4.4 Demand from Customers

The continuing proliferation of alternative methods for procuring building projects was envisaged by Masterman and Gameson (1994), to be as the result of the projects' ever increasing technical complexity and the client's continuing desire for speedy commencement and completion periods. These have led to the demand for devising more sophisticated methods of delivery systems selection.

Choosing procurement types other than the TBPS can decrease the project delivery duration, provide flexibility for changes and reduce adversarial relationships among participants.

Furthermore , other delivery systems allow for contractor participation in design, provide cost savings incentives to the contractor and provide alternative financing methods to the client (Gordon, 1994). Boudjabeur (1995) also was of the opinion that to be able to meet the clients' demand, there was a need for greater degree of financial planning; the need to reduce design and construction time and reduce the burden of contract administration on the part of the client. In general terms the above have brought increasing pressure to find other ways to plan and co-ordinate, in effect to manage the whole design and construction process. Root and Hancock (1996) assimilated the literature of Griffith, Naoum and Langford, and Franks and discovered that building clients are not happy with the traditional procurement and performance. They summarized the fact that changes in the demands of clients are leading to the development of new procurement methods.

This was supported by Bowen, *et al* (1996) when they assimilated the views of Moore, Ball, Franks, Hillebrandt and Cannon to conclude that the changes which are now taking place in the area of building procurement are due to the fact that demands by clients can not be met by the TBPS. Ambrose and Tucker (1999) observed that traditionally, the Australian construction industry has utilised only a limited number of procurement systems. However, with increasing competition, financial constraints and risk minimisation, the need for a more effective and flexible procurement system has become essential. The aim is to utilise a system that is best able to deliver the project on time, on budget and to the required quality level.

2.5 CONSTRUCTION INDUSTRY PERFORMANCE OF DEVELOPING COUNTRIES

Ofori (1980) in his research on the Ghana construction industry found that, the formal part of the industry is organised along similar lines similar to those of Great Britain. He observed that in Ghana the construction process basically follows the stages of client's decision to build, commissioning designers, tendering and construction.

He drew a parallel line between the lack of details in production drawings and the poor quality that was achieved. He said that the involvement of the contractor in the design is still a very rare practice in Ghana and drawings seldom provide sufficient solution for constructional quality problems.

According to Edmonds and Miles (1984), when studying changes taking place in the construction industry in developing countries, they decided to examine the evolution of the British system. They defended their decision by arguing that the British system formed the basis of regulatory or organizational framework in so many developing countries that its exclusion denies the construction industry the root in the whole analysis. They cited an example of the organisation of the construction industry in Ghana to have been derived from the British practice. To elaborate further, they said that in Ghana the industry inherited the rigidity and compartmentalisation system which existed in Britain in the 1950s. From this system of compartmentalisation, resulted the system of design departments being separate from construction departments.

Apart from Ghana, Edmonds and Miles (1984) found that the construction framework in Sri Lanka is founded on the "received British system" of strict separation of responsibility for design from responsibility for construction. They further revealed that in Sri Lanka, the transferred British system retains a powerful influence, not only with a separation of design from production, but also on contractual procedures that have been only marginally modified to suit local needs.

Although the organisation structure of the developing countries construction industry has been borrowed mainly from the United Kingdom, unfortunately these countries have not introduced the more recent positive changes and refinement that have developed to make the British model work more smoothly. For instance in Ghana, the contractor is never involved in the project at the design stage, package deal contracts have not been tried and the idea of project management consultancy has not been explored (Edmonds and Miles, 1984).

Furthermore Wells (1986) was of the opinion that the traditional system has been preserved more or less intact in developing countries. The same pattern of fragmented organisation is applied mechanically to all projects, large and small, and each professional jealously guards his territory at every stage of the building project implementation. Worse enough, the traditional system gives professionals very wide powers, although they have no financial liabilities. Edmonds and Miles (1984), realised that the performance criteria of the construction industry in developing countries has been unclear due to the confusion of the policy regarding the public or private sector. They cited an example of Ghana where an emphasis sometimes leaned towards encouraging the private sector, while at other times the policy has been to boost the capacity of the public sector. In Sri Lanka, the emphasis has been to execute construction projects through the private sector.

Nonetheless, although the long term objectives of the public sector differ from those of the private sector, the planned economic development policies adapted by the majority of developing countries after independence had something in common.

According to Chandra (1990), his experience in India indicated that planned economic development in relationship to the management of capital projects implied managing time, cost and quality. Further to the above, Edmonds and Miles (1984), revealed the fact that in developing countries only a third to one - half of the total time is taken up in t the actual construction of the project. This means that money and resources have to be committed within departmental budgets long before the project is of benefit to the community or the individual. Consequently, the social cost of delays in the pre-contract stage may be high. It could be seen from the above that as in developed countries, construction industry performance criteria in developing countries are more or less in the parameters of time, cost and quality.

On the other hand, several researchers have described how, upon achieving independence, many developing countries embarked upon major infrastructure/housing development programmes only to find that the costs were prohibitive because of the need to import materials.

Consequently, imports of materials, manpower and equipment were the norm rather than an exception. According to Wells (1986), this trend resulted in the rise in construction costs generally from between 40 to 60 per cent per annum in Sri Lanka. Similar conditions have been noted in Ghana. Wells (1986), explained that in Ghana as early as in 1965 an unhealthy reliance upon imported materials amounted to 60 per cent of the total project resource inputs. She observed that in Kenya, between1965 and 1967, there was a sharp rise in construction prices although no indicative figures were given.

In 1967 the Economic Survey Bureau of Kenya cited the inability of the construction industry to gear itself to the much higher level of construction activity required by the Government for the implementation of its development plans. It therefore seemed quite likely that delays and rising prices were indicative of the fact that constraints had already developed in the construction sector (Wells, 1986). Edmonds and Miles (1984), revealed that in addition to cost and time, there were complaints from of clients about a fall in the standard of work completed. They observed that in many instances construction standards have been set too high for the requirements of the developing countries and costs have, therefore, been higher than they needed to be.

In support of the above Wells (1986) indicated that in Kenya there seemed to be an almost general reluctance among contractors to undertake any kind of high quality building work involving complicated finishes or structures. They knew for sure they could not meet the consultants' specification, let alone their clients' satisfaction. This is probably, why in Sri Lanka the most common fault in specification is over-caution. This stems from suspicions regarding the technical competence of local contractors, so that the factor of safety is expanded to include a "factor of ignorance". Unfortunately the costs of over-specification rarely come to light although it is substantial.

According to Edmonds and Miles (1984), the fall in quality standards in developing countries comes from the fact that most of the standards in these countries are "imported". Little effort has been expended to modify and adjust them to the practice of the local industry.

Edmonds and Miles (1984) pointed out the fact that Sri Lanka had retained the quality standards found prior to independence in 1946. These specifications had been adopted from the then current British standards. They suggested that to be fair, the work involved in the task of revision should not be minimised; incorporation of local materials implies a substantial programme of testing, establishment of new standards and devising new methods for quality control. While the entire exercise could be too expensive for the developing countries, this forfeiture again is at the expense of customer satisfaction.

The consequence of imported standards was revealed by one author who was writing about project management in developing countries. Hutcheson (1990), revealed that in Vietnam there was a housing scheme funded by the Australian Government. Shortly after some of the houses had been occupied, a wind storm of about 144 kph nearly removed the roofs from several houses. An examination of the design process came to reveal that the designers had been accustomed to temperate codes and had failed to adjust to tropical wind loads.

2.6 ESSENCE OF CHANGES IN PROCUREMENT SYSTEMS IN DEVELOPING COUNTRIES

According to Ofori (1980), the effects of separation of design responsibility from production responsibility were evident everywhere in Ghana. He noted that drawings were insufficient in terms of details. He, further, recorded that, discrepancies between architects' and engineers' drawings were common, and the design would have to be changed, sometimes radically and substantially, at an advanced stage in construction. Another observation he made was that the above deficiency indicated possible areas where conflicts and disputes could arise during construction.

Similar experiences were recorded in Ghana by Edmonds and Miles (1984). They noted that Ghana's construction industry's fundamental problem could be traced to the systems and procedures related to the distinct division between the responsibility for planning and design and the responsibility for construction.

They gave an example that in Ghana, the Public Works Department was responsible for consultancy and planning of new developments leaving a state Construction Corporation to concentrate on the physical execution of projects. This means, amongst other things, that the contractor has no incentive to innovate.

According to Chandra (1990), the TBPS in India had been preserved more or less intact; indeed a number of additional complications had been introduced. This caused the construction industry organisation to be so ambiguous that the relationship between various participants involved in a project resulted in poor management implementation. He revealed that under the TBPS, time and cost overruns were common, making the majority of projects uneconomical. In his research he noted that, out of 184 central projects which were being monitored, 119 projects had suffered time overruns which in some cases were as high as 200per cent. Similarly, 125 projects had cost overruns, in some cases going as high as 750 per cent.

The failure of the TBPS to deliver in terms of time, cost and quality in developing countries as it is in developed countries has been one of the driving forces for the influx of alternative procurement systems. Rwelamila (1992) surveyed twelve large building projects in Botswana where the TBPS was said to be in use. He came up with the results which showed that delays had been occasioned on eighty percent of the projects because of late design.

A slightly lower percentage of seventy was recorded in Nigeria during the preliminary survey on time schedule slippage occasioned by the design in the project execution as the result of using the TBPS (Odeyinka and Yusif, 1997). In their case studies in Nigeria, they found that the delays nested in the TBPS had a significant effect on cost overrun.

They found that loss and expense claims due to delays and fluctuation claims during delay period accounted for up to 51 per cent of cost overrun, thus, impacting significantly on the cost of housing projects.

An example of a cause of a delays occasioned by the use of the TBPS was the late issuance of instructions. They revealed that in some cases, instructions from consultants had to be waited for upwards of one month. Other sources of delays were incomplete drawings. Wahab (1990), concludes that the problems of the Nigerian construction industry are many but the notable ones emanate from the separation of design from production; that is the leading feature of the TBPS. The end results are that contractors do not receive vital production information on time, variation orders are numerous, costs soar and disputes over settlement of reasonable unit rates for the extra work arise.

Valence (1999) was of the opinion that there is a significant trend towards single point project delivery and an increasing role of the private sector in providing an infrastructure in developing counties.

2.6.1 **Education for Builders**

In developed countries contractors are an important instrument of economic development and much efforts have been done to promote their managerial skills. In developing countries a contractor is often viewed as an unpatriotic, dishonest businessman who, given half a chance, would either use shoddy materials, leave out some parts of the structure, make unjustified claims or abscond with advances or loan paid to him or influence consultants to certify unjustified payments to him.

Ofori (1980) noted that even contractor's initiative to acquire management skills in developing countries have been far below expectation. He pointed out that in Ghana the response from contractors themselves to invitations to attend management and other courses has been far from enthusiastic. This, he said, was mainly because of financial commitment involved, but many contractors did not see the need for training since they make an adequate profit without it.

According to Edmonds & Miles (1984), the above attitude when added to the hierarchical set up of the TBPS make contractors in Ghana be treated as a lackey rather than as a partner in the construction process. They are kept in a subordinate position and educationally ignored.

Further, Edmonds and Miles (1984) observed that the training policy in the construction industry in developing countries has focused on upgrading artisan skills only. They cited an example of a highly ambitious USD 25,000,000 training scheme in Sri Lanka. This targeted over 55,000 construction workers for a three year period initiated by the World Bank. They found that although this would encourage participation by contractors, it mainly ended up sending artisan and equipment operators. Thus the crucial construction management skills were totally overlooked.

Wahab (1990) pointed out that the lack of education of management skills for contractors in developing countries seems to be the norm rather than the exception. This probably results in the slow progress in the performance of the construction industry. When writing about contractors in developing countries, Wahab (1990) cited the example of Nigeria where, apart from barriers of financial guarantees and politically non-acceptance in their own country, indigenous contractors lack corporate, managerial and technical experience.

According to Andrews (1990), he himself was identified by ILO Geneva, to head on secondment, a substantial construction management programme in developing countries, beginning in the African region. An arrangement was made permitting him to do so on a part - time basis from mid -1977 to the end of 1981. A guide to the "management of construction projects" was developed as a teaching text.

This guide treated the four basic design stages of briefing, design, construction and commissioning as a single process. The general strategy was first initially to some sixteen "English Speaking" countries. Experience gained by Andrews from a number of countries indicated that, almost none of whom had been exposed before to management thinking in construction activities. It became obvious that there was a need to improve the management of construction at every level of development.

Andrews (1990), noted that almost thirty years after the programme, high management ability gained by contractors added to the political turbulence, increasing uncertainty, specialisation, internationalisation, economic and environmental pressures and client sophistication, and forced the industry to move from the traditional system to more rational methods.

According to Wahab (1990), Dlakwa and Culpin (1990), Ogulana and Olomolaiye (1989), and Odeyinka and Yusif (1997); contractors in developing countries are entrepreneurs who are in the business of making money at the expense of good management. In fact, these contractors have very little ability to plan and co-ordinate contracts and hence have very limited knowledge about new construction marketing systems.

2.6.2 **Need for Capital Transfer**

According to Valence (1999), clients in developing countries are increasingly using a variety of procurement methods, aimed at reducing cost, establishing schedules, shortening duration, reducing claims and promoting constructability and inovations. He explained that the forces of change behind the Building Procurement System include technological changes, advances in regulatory design and the evolution of financial market. The popularity of Build – Operate – Transfer (BOT) procurement is growing in developing countries as a means of securing private sector involvement in infrastructure projects, thereby increasing investment from developed countries.

Mitrovic (1999) was of the same opinion that the growing economies in developing countries and rapid urbanisation are creating a huge demand for housing and a new infrastructure. In many developing countries their public sector is not strong enough to finance the change. So they are turning to the private sector to join in the construction, ownership and operation of national housing schemes and infrastructure. He concluded that provision of public projects by the private sector, frequently through BOT or BOO procurement models is leading to the diversification of the traditional client role.

2.7 TANZANIA CONSTRUCTION INDUSTRY

The most recent situation with respect to Building Procurement Systems in Tanzania is covered in chapter one under section 1.3. To avoid repetition only forces of changes on Building Procurement Systems taking place in Tanzania will be discussed in this section.

2.8 ESSENCE OF CHANGES IN PROCUREMENT SYSTEMS IN TANZANIA

There are a number of factors that contributed to the downfall of the TBPS and hence introduction of new delivery systems in Tanzania. These include the following:-

Commercialization of Parastatal Organisations: Mlingwa (1981) revealed that the main break-away from the controlled public sector traditional building procurement system was due to the ever-increasing number of parastatal organizations. These were allowed to use their own funds for development and be run commercially. They continued to commission building projects (mostly prestigious offices in the city and high - cost staff houses) using their own favourite procurement systems.

According to Wells (1986), the growth in demand for new building works on the part of these parastatals, whose share in total building investment increased from 19 per cent in 1980 to 36 per cent in 1982 and further commercialization of the public sector after trade liberalization in mid 1980s have been major factors responsible for the weakening of the TBPS by the public sector funded projects and thus, the genesis of other forms of procurement systems. To this end, the majority of the parastatals commissioned designs and construction direct to consultants from the private sector. In turn these private consultants advised their clients to follow the procurement paths which were in line with their experience.

Proliferation of "In - house" Professional Teams: Wells (1986) emphasised that a further decline of the Traditional Building Procurement System in the public sector was facilitated by the proliferation of "in-house" professional teams.

This involved designing, supervising building and maintenance work in a number of other ministries and in most of the parastatals and hence has enabled them to effectively by-pass the Traditional Building Procurement System previously advocated by government regulations. They adopted alternative systems that could suit their respective projects. The National Housing Corporation (NHC) for instance during its inception, the over-riding objective was quite simply to build houses, particularly low-cost houses. However, its current method of operation is quite different. It has set about building -up and boosting its own capacity for design and construction. At the moment NHC is acquiring plots, designing, building and selling completed buildings

According to Wells (1986), there is proof of the greater rationality and effectiveness in this method of organisation. She further contends that, this may be found in the fact that the cost of construction per square foot of living space by NHC, is probably the lowest prevailing in East Africa.

Expansion of Private Sector: Equally important to the proliferation of other forms of building procurement systems is the expansion of the private sector after the trade liberalization in the mid - 1980's. Nkinga (1996) writes that the public sector is pegged against more complex and long - term criteria. He further explains that other considerations besides economy are accountability, non - discrimination among potential contractors and respect for national and international obligations.

This argument is similar to the one by Hindle (1993), that the traditional system has been held in place in South Africa by the public sector who use the competitive bid method of contractor selection for accountability reasons. On the other hand, according to Nkinga (1996), the private sector does not follow any set procedure. It simply serves to achieve a good economic result for the client in terms of time, cost and quality.

The increasing use of alternative procurement systems in the private sector is further advocated by Oakman (1997). For the past ten years he has successfully completed at least thirteen (13) projects for the private sector with himself as the project manager worth above US$ 70m on which other forms of Building Procurement Systems were applied. The projects included 250 beds at the Sheraton Hotel; 40 beds at Pangani Game Fishing Lodge; 50 Mirambo Street Office Block; new Canadian Chancery (Dar es Salaam) and Office Block for Leyland Daf (Tanzania) Limited.

2.9 SUMMARY

The performance of the construction industry in any country has been found to be measured against the parameters of time, cost and quality. This is largely due to the fact that the primary objective of the construction industry is to meet Client needs and satisfaction. The client satisfaction has been reflected to projects which are delivered at the right time, at an aptimum cost and quality standard.

From the literature review, the parameters of time, cost and quality have been considered to the largely affected by the Building Procurement Systems used. The systems determined interaction of different players (organisation structure) duties and responsibility of each member within a building team.

However, it has been revealed from the literature review that the essence of Building Procurement Systems changes in developed countries differ from those of developing countries. Forces of change in Building Procurement Systems in developed countries included:-

Economic changes: That the massive oil prices of 1993/4 resulted to rampant inflation and recession to most of the world especially non-oil producing countries. To this end, clients and their advisors were under pressure to complete building projects as early as possible. Alternative ways of procuring buildings more quickly were, therefore, have looked into

Information technology: The need for fast exchange of information and growth of electronic technology for swift manipulation of construction data has necessitated the use of other Building Procurement Systems which can exploit information technology than the TBPS

Education for builders: The product of tertiary education programmes, have been producing "professional builders". This new generation are equipped with sound business skills and practice. They are, therefore, introducing changes in the delivery systems to meet client's satisfaction.

Demand by customers: Clients are in great desire for decreased project delivery duration, greater degree of financial planning and risk minimisation. This has brought increasing pressure on part of the consultants to look into other ways to plan and co-ordinate their building projects.

In developing countries Building Procurement System changes are mainly due to the education of builders and the need for capital transfer. The evolution of financial market has called Building Procurement Systems which can encourage private sector involvement in capital transfer to these countries. That is the reason for popularity of BOT procurement system in developing countries.

The case of Tanzania is not different from other developing countries. In additional to the education of builders and the need for capital transfer from developed countries other forces of change are summarised as:-

Commercialisation of parastatal organisations: These are being run commercially now and they are commissioning building projects using procurement systems which can be of benefit to them.

Information technology: The need for fast exchange of information and growth of electronic technology for swift manipulation of construction data has necessitated the use of other Building Procurement Systems which can exploit information technology than the TBPS

Education for builders: The product of tertiary education programmes, have been producing "professional builders". This new generation are equipped with sound business skills and practice. They are, therefore, introducing changes in the delivery systems to meet client's satisfaction.

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The case of Tanzania is not different from other developing countries. In additional to the education of builders and the need for capital transfer from developed countries other forces of change are summarised as:-

Commercialisation of parastatal organisations: These are being run commercially now and they are commissioning building projects using procurement systems which can be of benefit to them.

Proliferation of "In – house" Professional teams: This aspect was a supplement to the education of builders. The teams are able to design and manage construction projects in a number of ministries and parastatal organisations. Some organisations are able to acquire plots, design, build and sell completed buildings to customers.

Expansion of private sector: This force of change is similar to "demand by customers" for developed countries. Public sector advocated the competitive bid oriented systems for accountability reason whereas private sector serves to achieve a good economic result.

CHAPTER THREE

BUILDING PROCUREMENT THEORY

3.1 INTRODUCTION

As an aid towards a more logical approach to the selection of the most appropriate method from the proliferation of the Building Procurement Systems available, it is suggested that the different systems need to be categorised. Several writers and researchers have attempted to do so in a number of ways. For example, by the extent to which design and construction are integrated, by the amount of risk taken by all participating parties, on the basis of the way in which design and construction are managed, and by the portion of project tasks that is assigned to the Contractor in terms of design, construction and finance.

3.2 CATEGORISATION OF THE BUILDING PROCUREMENT SYSTEM

According to the NEDO (1983), the various formal categories of Building Procurement System were based on management styles. At one end were traditional arrangements where customers were expected to take an active part in the management of their projects. At the other extreme, under design - and - build arrangements, most of the client's management responsibilities and control were transferred to the contractor. Along this spectrum, a number of clients appointed various specialist consultants to manage their projects on their behalf and relieve them of tasks and responsibilities.

The consultant's role could, however, extend further in different directions from managing the construction process of both design and construction, to assuming the full responsibility for the project from its inception to completion. Alternatively, clients could centralise most or all activities under their own management. NEDO (1983) report, identified eight categories of Building Procurement Systems, these are:-

(a) Traditional Arrangement :

In this category clients appointed a consultant designer, usually an architect, as their principal protagonist in the project: to design the building, coordinate the contribution of other specialists, select the contractor and supervise the construction on site. Design and construction are separate, tendering for construction is usually competitive and detailed design work is largely completed before work starts on site.

The NEDO (1983) report further revealed that clients in this category were concerned about the "market" appeal of their buildings and wanted to retain control over, for example, peculiar details of appearance and quality of finishes that would always identify one designer from others.

(b) Separate Management Function:

Clients used various specialists to assist them in the organisation and management of their projects and to give themselves certainty that their intentions and targets were understood and achieved. This category were mainly used by experienced Clients and for projects where Clients needed quick completion by specific deadlines.

(c) Project Management:

Several clients appointed a project manager to act on their behalf within what still remained an essentially traditional arrangement. Project Managers, in this category, performed a wide range of tasks; they identified and negotiated for project sites, arranged financial backing, formulated initial briefs, negotiated with planning authorities, recommended and negotiated with consultants, process plant suppliers and chose contractors.

(d) Management Contracting:

According to the NEDO (1983) report, the most commonly used arrangement was management contracting, where the main contractor was replaced by a specialist in site management who worked for a fee. Their appointment at an early stage allowed for an early and integrated procurement, planning and site preparation and generally widened the range of construction expertise available to the client at this stage. Management contractors did not undertake any of the physical work on site, they let the construction to contractors in a number of packages, mostly by competition, often on approximate bills and co-ordinated and directed the work on site. They brought together and put to good use the services of small local builders who individually would not have had enough resources to handle the large projects but still had the backing of a large contractor's resources and capabilities.

(e) Fast Tracking:

In this category the management contractor's role extended to both design and construction. The contract was undertaken by a management consultant specialising in what was called a "fast tracking" service. This gave the Client maximum flexibility in developing his own requirements together with the assurance that short and precisely timed deadlines, dictated by his production process, would be realised.

The consultant programmed and co-ordinated all design and construction work and provided full time site management. With the help of the professionals appointed to the project, he sub-divided the project into relatively small self-contained packages to be designed and let for site construction as a sequence, fully interleaving the pre-construction and construction phases of the project and arranging them around the timetable of changes in the customer's production process.

(f) Integrated Design and Management Contracting :

The pre-requisite for this category was that the projects had a high process content and the service included the design of the process or at least the conceptual layout of the process plant. Design, procurement of materials and equipment and construction were integrated into one comprehensive programme which was backed also by detailed procedure manuals defining all working arrangements, responsibilities and lines of communication.

(g) Management In-house by the Customer:

Sometimes clients decided to manage their projects directly by themselves, using approaches that mirrored the various specialist management arrangements described above. They all dispensed with the main contractor but used outside expertise to a varying extent.

(h) Design and Build:

Clients who had chosen this category saw an advantage in the single contractual relation-ship with the design - and - build contractor, largely because responsibilities were clearly defined.

They considered also that the success of the arrangement depended as much on informal relationships as on formal definition of responsibility. Several clients turned to Design and Build after their architect's designs had proved too expensive for their budgets and were surprised at the level of savings they had achieved through this procurement system. In these and other cases the contractor modified earlier designs or design briefs to save time and/or costs, to the good effect. The contractor's concern for the practical aspects of buildability and speed was also often visible in the choice of materials and components or in the use of special processes and techniques. Some contractors had developed their Design - and - Build service around various building systems complemented by their own well rehearsed operating procedures.

Another attempt to categorise the Building Procurement System was made by Franks (1984), whereby seven different categories were identified. The basis of Franks' (1984), categorisation was the extent of integration of design and construction. The seven categories to be examined all incorporate features whereby design and construction are brought close together. To that effect Franks (1984), used the "traditional" system as a datum for comparing the variants. According to Franks (1984), the seven categories are as follows:-

(a) Traditional System:

The system entails the separation of the design and construction process. The design should be fully developed before bills of quantities, and subsequently, tenders are prepared.

(b) Construction Management for a Fee:

Franks (1984) explained that the essence of the system is that a building contractor undertakes to provide the management of the works for a set fee. In principle, the management contractor's status is similar to that of the architect (or other consultants) in that he is paid a fee for the professional services he renders and he functions parallel to the architect. The architect provides the design expertise and the contractor the construction management. Franks (1984) further elaborated that the contractor, in this category, is appointed much earlier than would be possible with the traditional system.

He is able to become a member of the design team and contribute his knowledge and experience in construction and management which would enrich the team.

(c) Package Deal and Turnkey Systems:

Both terms indicate the nature of the system. According to Franks (1984), the package contains everything the client needs for the building and the key that is turned symbolises the only action required of the client in respect of the project (other than paying the bill), namely, opening the door in order to take possession of the completed and fully functioning building and use of it.

Franks (1984) explains that the single point of responsibility which the package dealer offers is attractive to the client. The package dealer will frequently provide a comprehensive package comprising site identification and purchase, obtaining planning permission and building regulations' approval, soliciting for financing facilities and leasing.

(d) Design and Build :

Franks (1984) describes Design and Build by differentiating it from the package deal. He describes the package deal as involving firms with an interest in providing a semi-standardised building form which the contractor will adapt to meet the client's requirements, whereas the Design-and-Build contractor accepts responsibility for designing and building and type of building to meet the client's requirements.

Franks (1984) further explains that the system provides single point responsibility so that in the event of a building failure the contractor is solely responsible. There can be no question of "passing the buck" between the architect and the builder as has so often been the case in the past. The client's interests are safeguarded in this respect.

(e) Separate Contracts :

In this category the architect designs the works to meet the client's needs and arranges contracts, on the client's behalf, with a number of separate contractors.

Franks (1984) reveals that the system is by no means new but it fell out of favour when general contractors undertook the planning, organisation and control of all the specialist contractors' work.

The design may not be sufficiently advanced for drawings and specifications to be finalised because "parallel working", with the design and construction process proceeding concurrently, is a characteristic of the system. The construction management function, traditionally undertaken by the general contractor, is undertaken by the architect/manager perhaps with a builder's site manager/agent to assist him. Also Franks (1984) indicates that the architect/manager, in taking over the role of the general contractor in many respects takes on greater responsibilities than he would assume under the traditional system and in his client's and his own interest, it may be prudent for him to take out a performance bond.

(f) Project Management :

Franks (1984) explained the role of the project manager by referring to the NEDO sponsored Wood Report which suggested that the prime task of the project manager would be that of co-ordinating client requirements such that clear instructions from a single source can be provided to the other parties involved. Further explanation by Franks (1984) is that a significant difference between this category and most of the others described is that the client's principal contact is with the project manager, not an architect. The project manager is able to act as a leader who can take into account all aspects of the project; finance, feasibility, design and time and hold a balance between them. The design and construction functions are, however, separated so that those involved can act as partners on equal terms.

(g) The British Property Federation:

This category provides for an independent "client representative" who manages the project as a whole and who is not involved in it as a designer or contractor. He provides single point responsibility for the client and by virtue of his non-involvement in details, he is able to concentrate on management.

The category creates a design leader with overall responsibility for the pre-tender design and for sanctioning the contractor's design.

Whilst the NEDO (1983), report was based upon management styles the NEDO (1985) report, categorised the Building Procurement Systems using two measures, that is, how management specialists are introduced into the construction team and the extension of the responsibilities of one of the participants (say a contractor), across several, formerly separate activities (say in design). To this end four categories were identified by NEDO (1985) report, as follows:-

(a) "New" Traditional Organisation:

In this category the approach has been for customers to appoint an architect to design their buildings and a quantity surveyor to advise on cost and subsequently to employ a contractor to build under the consultants' supervision. Design and construction are separate and in principle design is complete before the work goes out for tendering.

(b) Design and Build:

According to NEDO (1985) report, design and build category is when the responsibility for developing the design devolved to the contractor. Most routinely, customers turned to design and build for the advantage of having a single contractual partner responsible for delivering their building according to an agreed time and cost.

(c) Management In-house by the Customer:

The NEDO (1985) report explains that customers who sought to diversify into development as a rule, employed architects to design the buildings and negotiate with planning authorities. On site, they used their own management skills and resources, supplemented by regular teams of subcontractors and they were usually motivated by a tenant or buyer waiting for the finished building.

(d) Specialist Management Arrangement:

In this category falls projects which had used specialist managers, either as management contractors who shouldered contractual risks, or under various arrangements.

Franks (1987, 1990) again classified the Building Procurement System in more or less similar fashion as he did in 1984.

However, Franks (1987, 1990) categorisation was more inclined to the extent to which the builder is engaged in the design and management of the project. In this respect four principal categories were identified by Franks (1987, 1990).

(a) Designer-led Competitive Tender:

Franks (1987,1990) explains that because most construction work clients seek, at first, someone who can express their needs in the form of a design, the designer is, traditionally, the leader of the construction process. According to Franks (1987, 1990), this "traditional" approach provides a useful datum for consideration of the other systems available.

Franks (1987, 1990) included "fast - track" within this category. He elaborated that the term "fast track" has been more subject to varying definitions than any other but the overlapping of design and construction as a means of reducing project time is a generally recognised characteristic of the term. This overlapping, often referred to as "parallel working", can also be achieved by using a modified version of the traditional system or by adopting a form of construction management or management contracting.

(b) Designer - led, Construction Works Managed for a Fee:

According to Franks (1987, 1990), there are almost as many types of different systems under this category. However, all of them have one feature in common, the management contractor or construction manager offers to undertake the management of the works for a fee. He is, in effect, in much the same relationship with the client as is the architect or any other consultant. The actual construction work is undertaken by specialist contractors, each of whom is contracted to carry out and complete one or more of the work packages which make up the whole of the works.

(c) Package Deal

Terms such as turnkey, package deal, design - and -build have the same meaning and they fall within the same category (Franks, 1987, 1990). The range of services offered include identifying sites, arranging mortgages, sale-and -leaseback and similar facilities, in addition to designing and building to meet client's requirements. The unique feature of this category is that the "contractor" is responsible for the whole design and construction of the building.

(d) Project Manager/Client's Representative-led:

Franks (1987, 1990) described this category in the same manner as he did in 1984 but amalgamated project management and the British Property Federation system to fall within one category. He further said that the inherent advantage of the Project Manager is that the contractor's knowledge and experience of the cost implications and buildability of design variables may be utilised to good effect because he contributes to the design.

Turner (1990) studied the UK construction industry and came up with a similar opinion to those reflected in the NEDO (1985) report. He noted that whilst it is currently accepted that design, management and construction can be viewed as discrete parts of the Building Procurement System and, for that reason he categorised procurement and construction contracts around these three distinctions. He further explained that combinations of design and construction or design and management and a distinct relationship of client, consultants and contractors do now occur as each project's circumstances develop or dictate. According to Turner (1990), the four categories revolving around design, management and construction are as follows:-

(a) Design and Build:

Turner (1990) described this category as the procurement position where one organisation is responsible to the client for both design and construction. He further elaborates that such types as the develop and construction, package deal and turnkey are actually variations of design and build.

(b) Traditional:

In the traditional system the client appoints consultants for design and for cost control, then generally after the design has been taken to any one of a number of stages, a main contractor is appointed to carry out the construction work (Turner, 1990). The common variations of the traditional are sequential, accelerated, partial design of parts or elements of the works.

(c) Management:

According to Turner (1990), it is perhaps significant that the element of "management" should have become separated, as "design" and "construction" were already separated. He noted that the separation probably came about because the general perception of the construction process was that construction was an industry that was badly managed. Therefore a system that emphasised the management process and exposed and explored management expertise (which should have been there anyway, but perhaps was hidden from the client and consultants in the traditional system), has come to the forefront of procurement options for many projects. Turner (1990) included management contracting, construction management and fee management in this category to be common variations of management.

(d) Design and Manage:

This category combines some characteristics of "design and build" with those of management (Frank, 1990). The peculiar characteristic of this category is that a single firm is contracted to provide management, design and construction of the works. The common variations to this category are design and manage by the contractor and design and manage by the consultant.

Masterman (1992) categorised all Building Procurement Systems based upon a critical element within the design and construction processes, that is, the relationship between the two processes. Elaborately, Masterman (1992) categorisation was based on the extent to which design and construction are integrated. He added an element of management of design and construction for consideration as a critical item for both processes.

Therefore, Masterman (1992) adopted the following categories:-

(a) Separated and Co-operative Procurement System:

In this category the responsibility for the design and construction aspects of the project are the responsibility of separate organisations, that is, design consultants and contractors. However, variants of the basic system may also be used which enable the contractor to be appointed at an early stage so that he may co-operate with the client, or rather client representatives (consultants) in pricing, providing advice on construction methods and buildability. In this co-operation, the commencement and completion of the project is accelerated.

(b) Integrated Procurement System :

Masterman (1992) explains that, in this case the design and construction become the responsibility of one organisation, usually the contractor. The client in this category has only one organisation to deal with.

(c) Management-oriented Procurement System :

The main emphasis in this group is placed upon overall management of the design and construction of the project. The construction element is usually carried out by works or package contractors and the management contractor has the status and responsibilities of a consultant. Unlike Franks (1984, 1990), Masterman (1992) did not categorise and consider the British Property Federation system as resulting from that fact, that it is, in reality, a very detailed administrative/ managerial framework. In this framework other procurement methods can be fitted to suit the requirements of a particular project. Thus, BPF does not exhibit the specific characteristics which would enable it to be placed with any certainty into any particular category.

Categorisation of Building Procurement Systems by Masterman (1992), was supported by Love, *et al* (1998), when they researched the systems proliferation within the Australian industry (ref fig 3.1).

Unlike Masterman (1992) who did not explicitly describe the position of the project manager, the categorisation by Love, *et al* (1998), clearly explained that project management is excluded, as it is considered that a project manager could be applied to any procurement method. In other words, to dispel a common misconception, project management is not a procurement method. The term merely means that the client has employed an agent to assist in undertaking a supervisory and coordination role within the project.

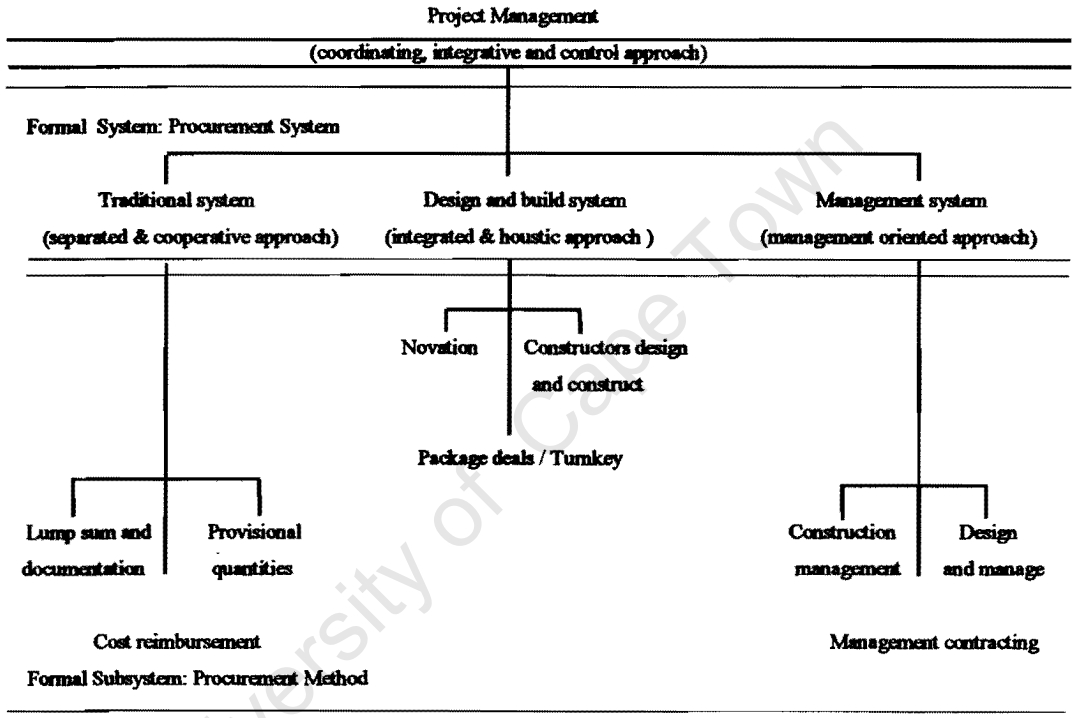


Fig. 3.1 Categorization of Building Procurement Systems (Love *et al*, 1996)

Gordon (1994) categorised the Buidling Procurement Systems along similar lines of the integration of design and construction as Masterman (1992) has done. However, he went further to include alternative ways of financing a construction project. In his analysis, he noted that any project would constitute three tasks, that is, design, construction and finance. His method of categorisation was therefore, based on the scope or rather the portion of the project tasks that is assigned to the contractor in terms of design, construction and finance.

To this end, Gordon (1994), identified three categories of Building Procurement Systems as follows:-

a) Separate Design and Construction:

Gordon (1994) referred this to be a common contracting method, often called the "traditional method". It consists of a separate designer, a general contractor (responsible for construction only), and the client responsible for project financing.

b) Design - Build:

The need for shortening the duration of projects by overlapping design and construction and/or elimination of bidding time allowed a contractor to participate in the design process, thus augmenting the design and construction experience (Gordon,1994). Such tasks as value engineering, constructibility analysis and cost estimating provide incentives for the contractor to save the owner's money. Therefore, the design - build team is a single entity that performs both design and construction of a project. The team can be one company or a partnership of firms. However, the financing aspect for the project remains to be the responsibility of the building owner.

c) Design - Build - Finance:

As the result of financial constraints, the owner must decide if the project can be more efficiently financed, either for the short term or long term, by the owner or contractor. If the later option is feasible then a one business entity may perform the design, construction and long-term financing and sometimes temporary operation of the project. At the end of the operation period which can be many years, operation of the project is transferred to the owner (Gordon, 1994).

In support of Gordon's (1994) approach, McDermott and Jaggar (1996), explained that the use of build, own, operate and transfer arrangements (or known alternatively, as the concession method), were sought and encouraged by government as a means of obtaining private sector finance for projects. A different approach that was used by a group of authors and researchers to categorise BPS was based on risk allocation and apportionment.

Flanagan (1990) illustrated the apportionment of financial risk between the Client and the Contractor when using various procurement systems as illustrated hereunder:-

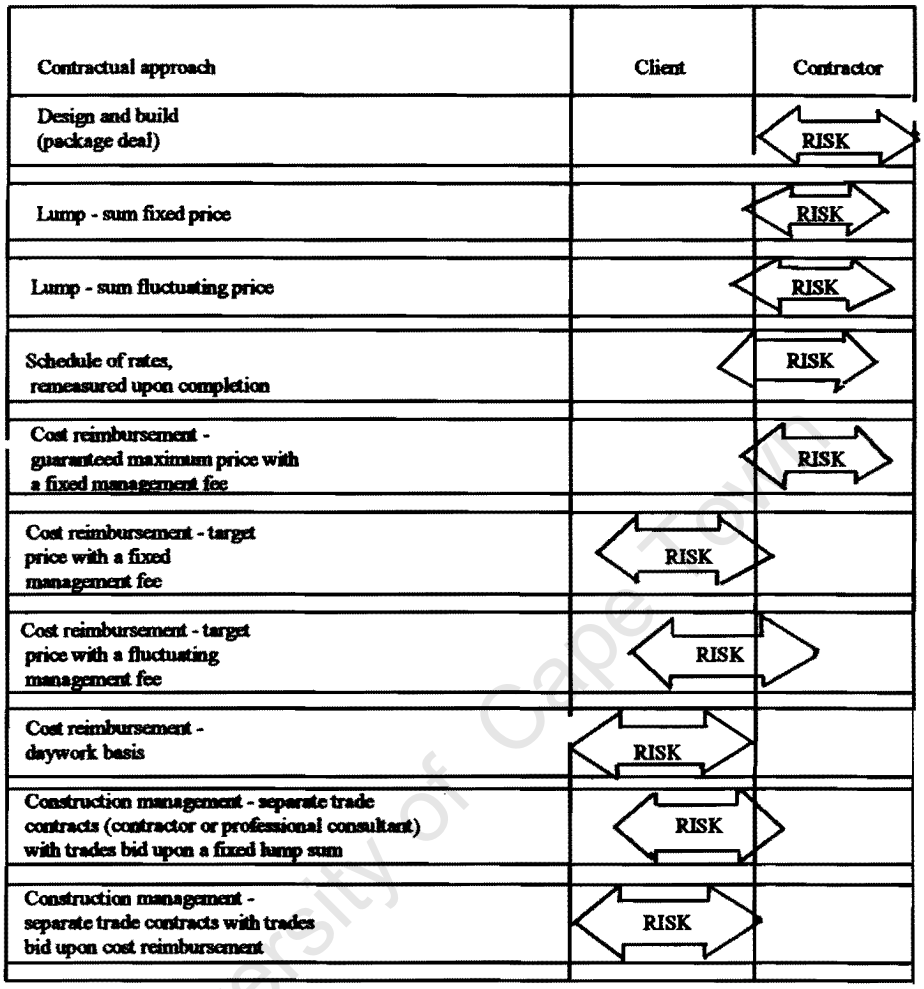


Figure 3.2. Allocation of financial risk (Flanagan, 1990)

However, Masterman (1992) rejected the adoption of risk allocation by Flanagan (1990) based on the contention that this method would only result in categorization which would be based upon single characteristics of procurement system, that is, financial risk.

Nonetheless, in support of Flanagan (1990), Sawczuk (1996) categorised BPS based on risk apportionment.

Before elaborating on those categories, he outlined factors that may influence risk apportionment in the building industry as follows:-

(a) The complexity and uniqueness of the project

(b) The employer's involvement with the design process

(c) The employer's involvement with the construction process.

(d) The required speed from inception to completion

(e) The required degree of price certainty

Furthermore, Sawczuk (1996), analysed the risks contained within the various procurement systems. He classified them as follows:

(a) Pure and Particular Risks:

These are usually covered by appropriate insurance and include injury to persons or damage to property by fire, storm, water, collapse, subsidence and vibration.

(b) Fundamental Risks:

This category includes damage arising from war, nuclear pollution, supersonic bangs, etc. and they are all the subject of statutory liability. No insurance cover is usually available or required.

(c) Speculative Risks:

Amongst the risks contained in this class are losses arising out of exceptionally adverse weather, unexpected ground conditions, unforeseeable shortage of labour and materials and other similar problems which are beyond the control of the Contractor. The responsibility for the risks within this category can be apportioned in advance between the client and contractor.

According to Sawczuk (1996), there are many Building Procurement Systems available but generally they can be grouped together under four main procurement categories which are outlined below. This categorization is based on the risk allocation/ apportionment.

(a) The Traditional System:

Sawczuk (1996) explains that one of the main aims of the traditional system is to spread the risks equally between the Client and the Contractor. He cited examples of liability for delays in completion of the project and the procedure for calculating the final price to be clearly stated in this system.

(b) The Design and Build System:

Sawczuk (1996) grouped turnkey, package deal and build-operate-transfer systems under this category. He explained that clients see the design and build contract as an opportunity to transfer the majority of the risk to the Contractor and at the same time give cost certainty to the client. However, the risk the client takes is that he should know what is required at the outset and stick to it as changes, once the contractor has been appointed, could be costly.

(c) The Management Contracting System:

The meaning given by Sawczuk (1996), with respect to management contracting, is similar to that offered by other authors, that, the managing contractor is appointed on a fee basis. Furthermore, the managing contractor does not usually carry out construction work himself, but co-ordinates and is responsible for the letting of a series of work packages. Sawczuk (1996) explains that, as the managing contractor is part of the employer and consultant team, there should be a reduced risk of claims from the construction site, as the managing contractor is selected for their expertise to control the works, and acts as a buffer and filter for any claims arising from the works contractor.

(d) The Construction Management System:

Sawczuk (1996) warned that if the client wants to avoid risks then this is the system to avoid. Sewczuk (1996) elaborates that under this system the client appoints a construction manager who is responsible for organising the tendering together with managing and co-ordinating of work packages. Each works package contractor enters into a direct contractual relationship with the client. Under this system, explains Sawczuk (1996), the client has complete control of the project but with it comes all the risks.

Sawczuk (1996) concluded that all the various procurement routes contain risk and it is for the client to decide how to distribute that risk. The more the risk is passed on to others, the more likely the cost of the building contract will rise, as the Contractor includes a sum of money to cover an increased share of the risk.

Although each contract carries its own degree of risk across all aspects of construction work, it is difficult to give a value to the degree of risk. However, Sawczuk (1996) illustrated in a simple comparative method the apportionment of risk between the client and contractor for the four main Building Procurement Systems.

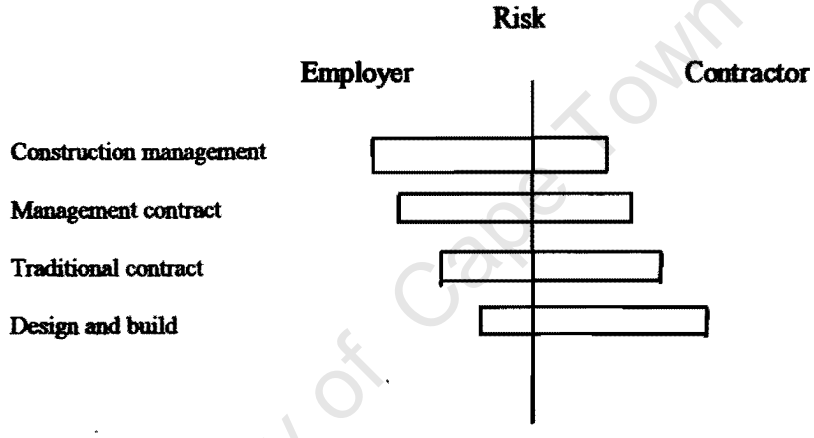


Fig. 3.3 Risk apportionment between employer and contractor (Sawczuk, 1996)

Cheung (1997) considered risk allocation in the building industry to be an essential tool for construction project management. He defined risk as "the exposure to the probability of economic or financial loss or gain as a consequence of the uncertainty associated with pursuing a particular course of action".

He further noted that risk planning in building contracts is, therefore, an integral part of overall risk management in construction project management. He then concluded that a party to a contract should bear a risk, where the risk is within the party's control and further suggested that Building Procurement Systems should be categorised based on this, although he did not attempt to give his own categories.

The approach adopted by Masterman (1992) to classify the Building Procurement Systems was supported by Hardcastle, Tookey, Longford, Chair and Murray (1999). They classified them as the separate / co-operative system, integrated procurement system and management procurement system Edum-Fotwe, Thorpe and McCaffer (1999) elaborated further:-

(a) Separated system:

Is often viewed as the traditional procurement strategy for the industry and involves a divided responsibility for the different phases of the process. For example, the activities making up the conceptual and construction phases are undertaken by several organisations operating from different establishments, but who act in supposedly close co-operation to achieve the project, and who are individually accountable directly to the client.

(b) Integrated system:

The need to minimise project risk as a result of the divided responsibility in the separated system, and thereby accentuate client satisfaction, led to the evolution of the integrated system. In this system a single point of responsibility is adopted for the client's procurement whereby several phases of the whole process is assigned to one organisation. Examples of these integrated systems include the design and build, turnkey, package deal and build-own-operate-transfer contracts.

Ambrose and Tucker (1999) did not elaborately classify the Building Procurement Systems into a readily understood system. They explained that the most common procurement system features in varying degrees include:-

. Complete documentation before construction
. Cost control
. Time management
. Quality control
. Appropriate risk sharing
. Client management / co-ordination responsibility

. Competitive tendering

. Contractor input into design, and

. Minimal variations.

3.3 TYPES OF BUILDING PROCUREMENT SYSTEMS.

Apart from categorisation, an investigation into different types of Building Procurement Systems is one of the major concerns of this study. The purpose of this part of the literature review is therefore to identify the prevailing types of Building Procurement Systems in the construction industry. With regard to different types of Building Procurement Systems, different authors came up with a number of avenues in which this can be achieved. (ref 3.2 above) For the purpose of this study, the author is of the opinion that categorization based on integration of design and construction is not adequate on its own. This is simply because in Tanzania, and probably in other developing countries, the financing of construction projects bears more or less the same weight as the design and construction.

Therefore, an analysis of different Building Procurement Systems will also incorporate alternative methods of financing the project parallel to the integration of design and construction. Under this approach nine different types of Building Procurement Systems are envisaged:

(i) Traditional Building Procurement system
(ii) Design and Build
(iii) Develop and Construct
(iv) Construction Management
(v) Project Management
(vi) Turnkey and Package Deal
(vii) Management Contracting
(viii) Design and Manage
(ix) Build - operate - Transfer

3.3.1 Traditional Building Procurement System (TBPS)

According to Franks (1984), the TBPS is the type of Building Procurement Systems where an arrangement requires the design to be fully developed before tenders are prepared. In this case, both the design and construction should not proceed concurrently. He went on to elaborate that, the need for the design to be fully developed at the time of going to tender leads to an "end - on" design/build arrangement.

To elaborate the foregoing scenario, Naoum (1989) defined the TBPS as "*the method of procuring a building in which independent of professionals (that is, architects, engineers and quantity surveyors) are employed by the client to complete the design work. The client then enters into a separate contract with a building contractor to construct the designed building*". This definition is well supported by many other authors. For instance Turner (1990) was of the opinion that in practice it is not the designer's role under the TBPS to be the manager of the construction.

He emphasizes that in the TBPS the client appoints consultants for design and for cost control independently. Then, generally, after a design has been completed, a main contractor is appointed to carry out the construction work in accordance with the design and specifications.

According to Masterman (1992), the TBPS was commonly used before the end of the 1700's or beginning of the 1800's when clients had for many centuries traditionally employed craftsmen on an individual basis, under the supervision of a master mason. His explanation of the TBPS was based on the fact that, the client appoints independent consultants (on a fee basis), who completely design the project and prepare tender documents. Competitive bids, often on a lump sum basis, are obtained from the main contractors. The successful tenderer enters into a direct contract with the client and carries out the work under the supervision (not management) of the original design consultants.

Masterman's (1992) critical analysis of literature reveals four basic characteristics of the TBPS, which are;

(a) project delivery is a sequential process

(b) the design of the project is largely completed before work commences on site.

(c) the responsibility for managing the project is divided between the client's consultants and the contractor. There is no direct involvement by either of the parties in the other party's activities.

(d) renumeration of the client's consultants is normally on a fee and expenses basis whilst the contractor is paid for the work completed on an admeasure or lump sum basis.

To sum up his work, Masterman (1992) concluded that the TBPS and all the systems making up the separated and cooperative category (hybrids of the TBPS) have one fundamental characteristic in common. The responsibility for the two main elements of "*design*" and " *construction*" is vested in two separate organizations - the design team and the contractor.

A good number of authors support the contention that project delivery is a sequential process under the TBPS. For instance, Hindle and Rwelamila (1993) emphasised that the TBPS is a system where a linear relationship exists between each of its key activities. According to these authors, the design is developed first, bills of quantities and other descriptive documentation are then prepared, tenders invited and a contractor is selected and construction is commenced, with a full set of working drawings and schedules.

Ndekugri and Turner (1993), described the TBPS as the approach which entails the client engaging separate organisations for three key services; design, cost advice and construction. According to them, by and large,the contractor is not appointed until the project is completely detailed in accordance with the design of the architect and the cost advice of the quantity surveyor. They further explained that the professionals involved are educated in professionally distinct courses and practically they belong to separate professional institutions.

Gordon (1994) and Walker (1996) also noted that the TBPS involves the client appointing a separate design consultant to develop a design to a point where a project is put to competitive bidding on the basis of which building contractors submit lump-sum quotations of cost and time to complete the work. Under the TBPS the contractor is responsible for construction only. Thus he has no input at the design development stage nor influences the construction of the design.

Appointment of the design team under the TBPS would involve the client contracting with the architect to undertake architectural design and also to act as the principal design consultant (Rwelamila and Ngowi, 1996; Ngowi, 1997). A separate contract may be entered into between the client and the structural engineer and quantity surveyor. Alternatively, the client may enter into a main consultancy agreement including architectural, engineering and quantity surveying input followed by sub-consultancy agreements between the principal consultant and other sub- consultants. Later a separate contract is entered into by the client and the contractor (builder)

3.3.2 Design and Build.

Under the Design and Build category, the contractor accepts responsibility for designing and building any type of building to meet the client's requirements (Franks, 1984). According to Turner (1990) and Masterman (1992), the Design and Build procurement system is an arrangement whereby one contracting organisation takes sole responsibility, normally on a lump sum fixed price for the bespoke design and construction of a client's project. Further to that, Masterman (1992) listed three fundamental characteristics of the Design and Build system, namely:-

(a) the responsibility for design and construction lies with one organisation
(b) renumeration is generally by means of a fixed price lump-sum
(c) the project is designed and built specifically to meet the needs of the client.

Ndekugri and Turner (1993) and Gordon (1994) made reference to Design and Build to in that the procurement strategy entails a single business entity acting as the contractor carrying out to completion and being the sole party responsible for, not only the field operations (including the marshalling and allocation of manpower, equipment and materials), but also the design of the works. In forming the Design and Build business entity the team can be one company or an association of firms, that is a consortium (Gordon,1994). Contrary to the TBPS which is carried out in sequential form, the Design and Build by its nature is conducted in a mainly overlapping manner. The design is completed whilst construction is already underway, resulting in early completion of the project. The above is in line with Boudjabeur's (1995) opinion when he explained that the Design and Build system provides the necessary multi-disciplinary approach and integration because it forms a designer - contractor teamwork at an early stage of the process. He further explained that the Design and Build system vests the authority, and so responsibility, of both the design and construction within one organisation, that is the contracting side of the industry, from initial briefing to the production of the finished building.

However, the categorization by Sasillo and Mansfield (1995), was not clear because they seemed to have combined different types of Building Procurement Systems within one explanation. In their explanation they stated "*All - in - contract is sometimes called a Package Deal, Turnkey or occasionally a Management Contract or system. — in this contract system a firm with adequate and proven management capacity is appointed as a management contractor to organise design and construct on behalf of the employer*". The above description groups together different scopes of design, construction and financing assigned to the contractor and hence needs to be separated. Package Deal, Turnkey, Management Contract should be separated from the Design and Build system which seems to have been explained in the above statement.

The explanation by Mohsini, Sirpal and Davidson (1995), and the definition by Songer, Molenaar and Robinson (1996), cleared the confusion created by Sasillo and Mansfield (1995), when they described Design and Build procurement system as the method whereby one entity or consortium is contractually responsible for both design and construction. Also Konchar and Sanvido (1999) were of the same opinion that Design and Build is a project delivery system where the owner contracts with a single entity to perform both design and construction under a single design-build contract. Contractually, Design and Build offers the owner a single point of responsibility for design and construction services.

3.3.3 Develop and Construct

This is the procurement system whereby both the consultant and the contractor are involved in the design stage but in the sequential or linear form. Turner (1990) explained the Develop and Construct system as the method whereby consultants design the building required to a partial stage, often called a "scope design". Thereafter competitive bids are obtained from different contractors that develop and complete the design and then construct the building.

Masterman (1992) detailed the description of the concept of Develop and Construct. His description was based on the fact that the client's consultant is provided with a brief, which he may also help to formulate, from which he prepares conceptual drawings, sketch designs and a site layout often including the disposition of individual buildings and their plan forms. The contractor then develops the conceptual design, produces detailed drawings, chooses and specifies materials and submits these proposals with his bid in the same way as with design and build.

Walker (1996) explained the Develop and Construct system as the procurement approach which provides for an organisation to be contracted by a client to manage the design and construction processes. In this explanation two fundamental aspects could be easily seen as missing: first is the input of consultants appointed by the client at the onset of the design. Secondly, the contractor is required to develop the design as it is created by the client's consultant and not to manage it.

3.3.4 Construction Management

According to Franks (1984), the essence of the system is that a building contractor undertakes to provide the "management" of the works for a set fee. He explained further that the contractor's fee usually includes the cost of the items which appear in the preliminaries bill in the TBPS. The construction management contractor normally does not undertake the building works himself but a subsidiary company may tender competition with other specialists. For clarification, writes Howes (1988), the client enters into an individual contract with the management contractor (for the management) and with other contractors for the various work packages. Under the Construction Management System the contractor is appointed much earlier than would be possible with the TBPS. Also the contractor is able to become a member of the design team and contribute his construction knowledge and management expertise. During construction, such a manager has the power to negotiate and supervise all contracts and subcontracts of the project.

Howes (1988) clarifies that the Construction Management Contractor can not share any of the profits made by those working for him, nor would he take a percentage of their turnover. The services provided for managing all the works contractors to deliver the project is paid directly by the client in the form of either a fixed fee or a fee as a percentage of the cost (Gordon,1994). The works contractors individually enter into a direct contract with the client , then the construction manager acts as the employer's agent when dealing with each of the separate contractors (Turner, 1990 and Masterman, 1992).

According to Howes (1995), the essence of construction management enables the designer to design and the construction manager to manage the works contractors. Initially the architect remains the manager of the design process with the construction manager providing assistance on buildability, procurement options (for separate packages), programming and value engineering. This changes at the construction stage when the construction manager becomes the principal agent managing the whole process, issuing the trade packages including the selection and awarding the sub-packages to trade contractors.

Emmitt (1996) in one of his literatures advocated the use of Construction Management System and explained that architectural education does not teach architects to build, it teaches them to design, therefore the adoption of construction management by architects is a new direction requiring a more specialised discipline. In the Construction Management System the contractor acts as a consultant builder appointed by the client. He provides significant professional management services on the practicability of the design and the expected construction method to be employed. The client enters into direct contracts with trade contractors and other specialists to undertake the works but are all mobilised, supervised and managed by the construction management team (Gidado and Barter, 1996; Walker,1997).

According to Konchar and Sanvido (1999), under the Construction Management, the owner contracts separately with a designer and a contractor. The owner contracts with the design company to provide a facility design. The owner selects a contractor to perform construction management services and construction work for a fee, in accordance with the plans and specifications.

3.3.5 Project Management

According to Franks (1984), the time - honoured client - architect - builder relationship was sometimes inadequate as a system for constructing buildings within budgeted cost and tight time schedule. There was a need for someone to manage the project as a separate, distinct member of the construction team - a project manager.

Further elaboration by Franks (1984) is that the person appointed to the project management function must have a good knowledge of design procedure, contruction economics and construction methods. He (Franks,1984), analysed the NEDO sponsored Wood Report and revealed the suggestion in the report to the effect that the project manager's prime task would be that of co-ordinating client requirements such that clear instructions from a single source can be provided to the other parties involved.

The above explanation is in line with what was described by Hibbert (1988), who was of the opinion that the emergence of project management was necessitated by the need for a greater degree of emphasis to be placed on the management control of construction projects right from inception through to commissioning. His clarification on the qualities of the project manager coincidently was similar to that of Franks (1984), when he emphasised that project management should be a discipline requiring a professional approach, a keen understanding of both the professional design languages of the project as well as the contractors. It was further suggested that, above all, there should be a demonstrated ability to be able to manage both people and the system to ensure the successful outcome of the project. In his summary, Hibbert (1988), concluded that project management is the discipline required on a project development to **evaluate** and **establish** prime objectives clearly in the areas of function, quality, time and cost, and subsequently to **monitor** and **control** project performance in order to ensure that these agreed budgets are met. The emphasis here must be to have full control, with a very clear point of responsibility aimed at achieving the goals.

The above conclusion by Hibbert (1988) supports the rather emotive statement by Powell (1988), himself an architect, when he was violently opposed to project managers taking a principal agent's role without having the necessary expertise. He referred to this type of project manager "... *the profession with no teeth to be effective - no responsibility - no liability - but big fees....*". He believed that project management is another word for the management of resources to achieve objectives within a given time span.

Project management requires a knowledge of priorities, that is, optimum management of resources and priorities in the design and documentation stage and to manage resources and priorities in the erection and completion of a building stage. Hindle and Rwelamila (1993) observed that project management takes the dual role from the architect. It allows co-ordination and supervision to be carried out by one member of the team who is dedicated to the task.

Therefore it is evident that the overall planning, control and co-ordination of a project from inception to completion, meeting constraints such as time, cost, product quality and client satisfaction is the fundamental responsibility of the project manager (Aouad, Kawooya and Price, 1996).

3.3.6 Turnkey and Package Deal.

The term "Turnkey" is used synonymously with the term "Package Deal" by many authors and in this literature review will be used interchangeably. According to Franks (1984), the package contains everything the client needs and the key that is turned symbolises the only action required of the client in respect of the project (other than paying the bill), namely, opening the door in order to take possession of the completed building and then use it. Package dealers provide buildings rather than designs. They frequently advertise their services and / or product in newspapers and journals read by the people who are likely to make decisions regarding their firms' future building needs. They may offer to find a site in any part of the country where, say, government grants are available to the client in order that he has an incentive to expand his business in that area. In addition the dealers may undertake to obtain planning permission and building regulations approval, carry out construction and even arrange a mortgage, sale and lease back or similar facilities.

According to Turner (1990), the term turnkey is used, when the key is perhaps meant to symbolize the client's only required action, in addition to paying money. He further noted that speculative, private housing is a prime example of turnkey. Further elaboration on the Turnkey System is that competing contractors may use a significant part of their own or another's proprietary building system or they may be constructing variations of a repetitive theme.

The significance of this system is that buildings are provided rather than the innovative designs. Turner (1990) elaborates that a package dealer may also offer to provide or to find a site, to sell, mortgage or lease his product. Masterman (1992), on the other hand, regarded the package deals to be different from the turnkey system in this respect.

(a) Design :

The package deal system virtually provides an off the shelf product. The idea is for the client to be able to buy a suitable building in the same design as if he is purchasing any other large consumer article. The turnkey system mitigates the weakness of package deal because the idea of the purchasing the design off the shelf is attractive in theory because an adapted standard product is unable to fully satisfy the needs and criteria of the majority of the clients.

(b) Ending of the responsibility:

The package dealer ends his responsibility after the building has been completed. The responsibility of the turnkey contractor is often extended to include the installation of equipment, recruitment and training of property management and operatives.

(c) Funding :

The package deal system does not indicate the source of funding but it only explains that the client pays the dealer at the end of the project. The turnkey method extends the contractor's obligations to include the arrangement of funding for the project. Apart from the above characteristics, the turnkey and package deal methods generally echo the features of one another. The turnkey team or package dealer is one business entity that performs the design, construction and construction financing of the project (Gordon, 1994). Accordingly, the client is involved in relatively little design, and a contractor is appointed to undertake the principal part of the design and construction the work. Payment is made at the completion, when the contractor turns over the "key" (Boudjabeur, 1995).

3.3.7 Management Contracting

Naoum (1989) described the Management Contracting as the method of carrying out a construction project where a contractor is appointed at the pre-construction stage and paid on a fee basis, to manage and deliver the project. The fee comprises a percentage for profit and fixed overheads. All construction work is carried out by sub-contractors, selected and appointed in consultation with the client and his professional advisers.

This form of procurement is not considered as pure "management" because apart from employing subcontractors to deliver the project the management contractor can, himself, provide a considerable proportion of labour, materials and plant. He is also often heavily involved in the application , as well as the management of the works (Turner, 1990).

Masterman (1992) agrees with Turner (1990) that management contracting is the method whereby, in exchange for a fee, the contractor agrees to carry out building works at cost. Furthermore, Masterman (1992) explains that the management contractor provides some limited management expertise to the client and his design team.

However, Masterman (1992) differs with Turner (1990) in one aspect, that the management contractor does not carry out any of the construction work himself . The actual work is divided into a series of separate packages, generally for different trades or functional elements of the building to be undertaken by individual subcontractors. Masterman (1992) clearly indicated the difference between construction management and management contracting by explaining that in the former case, the client enters into contracts with package contractors whereas in the latter case, it is the management contractor who usually enters into contracts with works contractors for the implementation of these packages.

According to Teo and Ofori (1999), Management Contracting originated in USA in the 1940s. They described Management Contracting as a professional service offered by a management organisation, often the general contractor, to the client, to manage both design and construction stages of a development project. He is appointed by the client at an early stage in the project, to join the professional team to contribute his expertise in construction, market intelligence, planning and cost. However, the Management Contracting does not execute the actual design or construction work. Actual construction is divided into packages and undertaken by various work package contractors. The Management Contracting is paid on a fee basis.

3.3.8 Design and Manage

The Design and Manage system combines some of the characteristics of Design and Build with those of Management. At one moment in time a single firm may be appointed for the project design and management, generally for a fee, and to deliver the project by employing works contractors as its subcontractors to design and/or construct. Alternatively the project designer and manager is the client's agent who designs and manages the works, obtains subcontract tenders from works contractors who then each enter into direct contracts with the client (Turner, 1990).

Masterman (1992) explained that Design and Manage as a procurement system where a single organisation is appointed to undertake both design of the project and manage the construction operations using package contractors who carry out the actual work. In his analysis of the system he came up with two variants similar to those indicated by Turner. He elaborated that in case of the contractor variant, package contractors are employed by the contractor; whereas when using the consultant variant the works contractors are directly employed by the client.

Further reference to the Design and Manage system is indicated by Boudjabeur (1995), when he indicated that under the system, the contractor is employed to undertake the majority, if not all, of the design and is responsible for the overall management of the project. On the other hand, Emmitt (1996) referred to Design and Manage as the procurement route which allows the architect (the designer), to communicate directly with trade contractors and eliminate the main contractor.

3.3.9 Build - Operate - Transfer (BOT)

Tiong, Yeo and Mc Carthy (1992) explained that the build - operate - transfer concept represents a step forward in meeting the needs of developing countries for more capital investment in infrastructure and industrial construction. They commented that the BOT model of project management has been heralded as bringing a new age in contracting, particularly in the developing world, through private - sector franchising of the building and operating of major projects.

According to Gordon (1994), the BOT system is when one business entity is appointed to perform the design, construction, long-term financing and temporary operation of the project. At the end of the operation period, which can be many years, operation of the project is transferred to the owner.

Tam, Li and Chan (1994), studied the operations of BOT in some countries of South - East Asia (China, Philippines, Thailand and Indonesia). They came to the conclusion that the BOT joint venture provided plenty of opportunities for foreign construction, suppliers and financiers. They observed that it attracted private sector involvement in infrastructure projects which involved private financiers, consultants, contractors and utility operators coming together to build a facility under a concession from a public authority. They, therefore, inferred that the BOT system was likely to overwhelm the building industry in South – East Asia in the next 30 - 50 years.

Tiong's (1995) analysis revealed that the BOT system has two main components in its tender, that is, technical design and the financial package. He commented that the ability of the competitor to provide an attractive financial package has a greater impact in winning the concession than the project's physical design.

He further elaborated that the package's technical solution may not be strongly supported especially if it is a political concession. Haley (1996) was of the opinion that the BOT strategy was being introduced in both developed and developing countries as an alternative way to finance infrastructure and industrial projects, both small and large. He elaborated that the concept is being used in transportation, energy, sewerage and water treatment plants, health care and education.

Concerning the BOT itself, Haley (1996) explained that where the private sector is granted a concession from the state to build, finance, own and operate a facility and, after the time specified in the concession period, is obliged to hand it back to the state. According to him, this concept is variously described as BOT, BOOT, BLT, BT and BTO depending on the terms of the agreement.

The basic components of BOT described by Haley (1996), are as follows:-

. Build design manage project implementation carry out procurement finance construct
. Own hold interest under concession
. Operate manage and operate facility carry out maintenance deliver product / service receive payment for product /service
. Transfer hand over project in operating condition at the end of concession period.

In a similar way BOT was explained by Thomas (1997) as a method of construction and engineering procurement in which government or a private body offers a concession to build a piece of infrastructure, operate it over a number of years and transfer it back to the government or private body. The project is usually financed by private equity and private finance and the equity share holder reaps their rewards by way of dividends. The government's or private body's reward is to obtain a facility which it could not otherwise afford.

According to Thomas (1997), under BOT the government's or private body's obligations are to hand over the concession to the concession company, at the commencement, approve the design, honour any guarantees and to take back the facility at the end of the concession period. The concession company's obligations are to design, finance, build, operate and maintain the facility for the duration of the concession and to hand back the facility in a good state of repair at the end of the agreed concession period. Tiong and Alum (1997) added that the promoter must fully understand the government's needs and concerns and be able to address them through the right package of the winning elements.

Taylor (1998) put BOT in perspective when he commented that many engineering and construction companies realise that today's customers require more than only design or construction capabilities. Instead they require a total solution approach. He emphasised that the operation phase of a BOT project presents the greatest management challenge, because during this phase, the private investment consortium is able to collect revenue from users of the facility.

3.4 SUMMARY

It is clear that each type of procurement system has evolved to suit a particular client or projects needs and that each has certain characteristics that can be said to offer different strengths and weaknesses. In order to better understand these, different ways of categorising Building Procurement Systems have been developed. The approaches range from management style, the extent to which design and construction are brought together, different ways of financing building projects to the risk allocation a and/or apportionment. A summary of authors and researchers who have attempted to categorise Building Procurement Systems is as tabulated below for reference:-

Table 1: Procurement Categorisation

Author / Researcher	1	2	3	4	5
NEDO (1983) report	*				
Franks (1984)		*			
NEDO (1985) report			*		
Franks (1987)		*			
Turner (1990)			*		
Franks (1990)		*			
Masterman (1992)			*		
Gordon (1994)				*	
Mc Dermott, *et al* (1996)				*	
Love *et al* (1998)			*		
Swaczuk (1996)					*
Hardcastle, *et al* (1999)			*		
Edum-Fotwe, *et al* (1999)			*		
Ambrose, *et al* (1999)			*		
Total	**1**	**3**	**7**	**2**	**1**

Key:

1 = Management style

2 = Integration of design and construction

3 = Integration of design, management and construction

4 = Integration of design, construction and financing

5 = Risk allocation and / or apportionment

The table above indicates that the process of Building Procurement Systems categorisation is still evolving. There is a clear perception that although the integration of design, management and construction is still popular, as the table demands more authors it equally pushes to the right to demand more columns for other categories of Building Procurement Systems. Therefore, the Building Procurement Systems development is proceeding faster than the authors can probably describe in books.

Nonetheless, from the table above, it may be concluded that whatever system is under consideration aspects of management, design, construction, and more recently, financing of building projects need to be looked into in totality. The trend all over the world and particularly in many developing countries is towards BOT, BOOT and similar systems. This trend was explained by authors as being a means of developing countries to seek and encourage private sector finance for building projects.

CHAPTER FOUR

THE SELECTION OF BUILDING PROCUREMENT SYSTEMS

4.1 INTRODUCTION

Thus far, Building Procurement Systems theory and their development have been discussed in general terms. The previous three chapters have examined the history, theory and development of Building Procurement Systems and their particular characteristics. However, the question "how can anyone decide about the type of procurement system to be used for a given project"?

This chapter is concerned with clients of the construction industry and their needs in terms of achieving success in implementing their building projects. Different types of clients have differing needs and it is therefore necessary that these are identified and then matched with the procurement systems whose characteristics are most likely to satisfy those needs.

Furthermore, this chapter reviews different methods clients should employ to select the correct route so as to ensure a successful outcome to the design and construction process. Different authors have tried to provide sufficient guidance so as to make the process of choosing the right option less hazardous.

It is clear that there are several factors which are repeatedly identified as significant considerations in Building Procurement Systems selection. Nahapiet and Nahapiet (1985) considered types of clients and the client's knowledge and experience in commissioning building projects to be among them. Masterman (1992) established that specific categories of client determine project success according to different criteria. He emphasized that it is necessary for members of the building industry to be aware of these various customer groupings and their basic characteristics. This assists in the selection of the most appropriate procurement system for the particular project.

Further to the above, Masterman and Gameson (1994) elaborated that clients are not a homogeneous organized group of individuals, or organizations, and are thus unable to apply uniform standards from their own, or consultants' knowledge of available procurement systems.

Masterman and Gameson (1994,1997) also cited the quote by John Brandenburger, a founder member of Ove Arup, as saying, "Clients are simply an assorted collection of men and women seeking advice from a member of one or more of the professions." To this end, many authors have acknowledged that a range of clients exist, and certain classification of client types have been produced. This diversity of clients undoubtedly affects the nature of client's interaction with professionals during the early phases of the procurement of their buildings (Masterman and Gameson, 1997).

4.2 CATEGORISATION OF CLIENTS

Nahapiet and Nahapiet (1985) attempted to categorize clients based on two important attributes: (a) whether they are primary or secondary constructors and (b) their level of project experience. Further elaboration was that, primary constructors are those clients such as property developers, whose main business and primary income derive from constructing buildings. Secondary constructors are those for whom expenditure on constructing buildings is a small percentage of their total turnover and for whom buildings are necessary in order to undertake some other business activity, such as manufacturing.

An attempt by Franks (1990) revealed that clients of the construction industry range from those who commission building works once or twice in their lifetime and do not know what to expect, to those who are, in effect, "professional" clients with regular projects, clearly defined needs and high expectation. To this end, he came up with five categories of Clients as follows:-

Category A: "Occasional" Clients who build for their own use or occupation such as church authorities, public service utilities, industrialists, manufacturers, commercial undertaking and medical practitioners.

Category B: Those acquiring land and/or property and developing them to let on their own behalf or to sell to pension funds or similar investors

Category C: Housing associations; both local authority backed and private. The category includes associations providing homes for the elderly

Category D: Local authorities at district and County level

Category E: Health care bodies; National Health Service and private sector.

Birrell's (1991) categorization was based on the client's knowledge of Building Procurement Systems. He explained that a client whose knowledge of the Building Procurement Systems is considerable, creates greater potential to reap the full benefits of construction management or design/build approaches. The other group of clients whose knowledge of Building Procurement Systems is small could be served by the traditional or construction management approaches.

According to Masterman (1992), Clients have traditionally been divided into the two basic classic categories of public and private organizations. However, Masterman (1992) adds that it has also now been universally acknowledged that subdivisions of these categories have existed with the two main divisions relating to: (a)the client's experience of implementing building projects; and (b) whether or not they are "primary" or "secondary" constructors.

The definition of experience by Masterman (1992) is based upon the frequency with which clients commission building projects. He suggested that those organizations who only carry out the construction of a new building project once every five years or more should be categorized as inexperienced and those who carry out building projects on a continuous, or regular basis, that is more than once every five years, should be described as experienced.

The other main subdivision by Masterman (1992) of the public and private categories, refers to the relationship of the client's business activities to the completed building project. He identified primary constructors as those whose main business activity and primary source of income derives from constructing buildings for sale or lease. Secondary constructors are those who require buildings to house and undertake their main business activities and whose expenditure on construction represents a small proportion of their annual turnover.

Gameson and Masterman (1994,1997) in their attempt to categorise clients made a reference to a survey by Newman *et al* (1981), which produced a list of 18 client types. Nonetheless, the entire list depicted different client sectors, primarily with the distinction between public and private sectors. Gameson and Masterman (1994, 1997) cited explanations by Turner (1990), that public clients have one distinct characteristic derived from the need for public accountability. Therefore, there is a tendency for this sector to use a system of building procurement where direct comparisons can be made.

Further to the above, Gameson and Masterman (1994, 1997) cited Hillebrandt and Morledge to elaborate that the level of experience of clients greatly influences the method they use to appoint some form for adviser to assist in the development of their building requirements, and ultimately select procurement systems. To that end Nahapiet and Nahapiet (1985); Gameson and Masterman (1997), proposed that the categorization of clients should be based upon the following characteristics, whether they are primary or secondary constructors and notwithstanding their level of construction experience. They suggested the following definitions:

Secondary: Clients for whom expenditure on constructing buildings is a small percentage of their total turnover, and for whom buildings are necessary in order to undertake a specific business activity, such as manufacturing.

Primary: Clients such as property developers, whose main business and primary income derive from constructing buildings

Inexperienced: No recent and relevant experience of constructing building, with no established access to construction expertise

Experienced: Recent and relevant experience of constructing certain types of buildings, with established access to construction expertise either in - house or externally.

Concerning experience, Birrell (1991) clarified that an important issue to raise is that client experience cannot solely be based upon the premise that they have previous experience of building alone. The critical factor in such a case is whether a client or organization has previous experience of a particular type of a building. Birrell (1991) used the example of airport authorities. They may have built an enormous amount of expertise over the years in the construction of airport terminal buildings. However, faced with the requirement for a new corporate head office building, the level of previous expertise, within their organization of this type of building would be limited in comparison to that of producing terminals.

There is thus a consensus of opinion among most researchers, authors and authorities that clients can be categorized firstly, as public or private, then as experienced or inexperienced and finally, as primary or secondary constructors. These categories, together with examples of types of clients that fall into the various classifications are show in figure 4.1 below. However, it should be borne in mind that many other subcategories probably exist in addition to those identified.

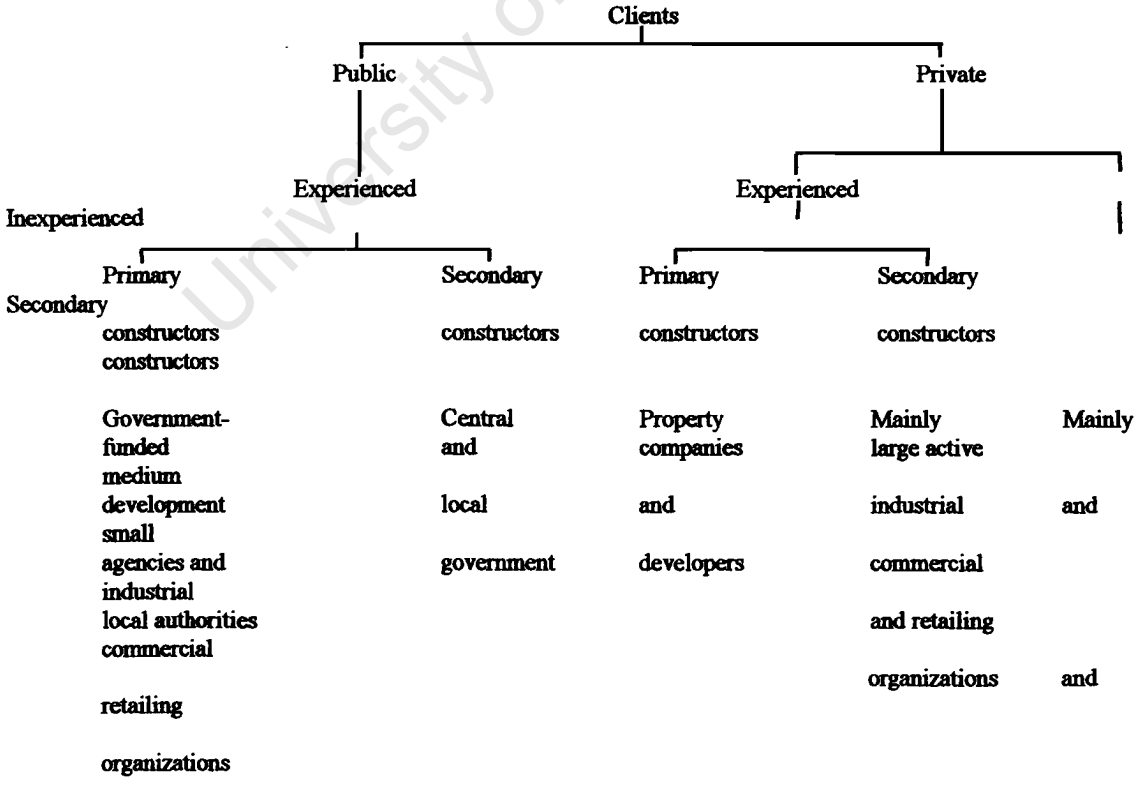


Figure 4.1 Categories of Clients (Masterman, 1992)

4. 3 CLIENT'S NEEDS

Franks (1984) in his definition of Building Procurement Systems uses the phrase "--- client with need for a building --- ". In his elaboration of the quoted phrase he emphasized that any effort as to the selection of Building Procurement Systems should fulfill first and foremost the client's needs. Further to that, Franks (1984) explained that clients are concerned with " buildings" per se, that is, the end product of the building industry. He noted that clients are not particularly interested in the means used to achieve the end as long as the buildings meet their needs. A client's need is for a shelter in which he can live, work, pray or play, as the case may be.

The findings of Nahapiet and Nahapiet's study (1985) suggest that amongst the most important attributes of projects of relevance to the choice of Building Procurement Systems are the client's requirements. They suggested that like clients with like project requirements may have like and consistent project characteristics priority ratings. They briefly noted that client's needs would be in the form of tight cost or fast speed demands.

Franks (1987) was of the opinion that three parameters were dominant in terms of building performance, that is, solidity, convenience and beauty. The heading of convenience was expanded to accommodate these words; "built by a given time" and "economy". To this end, Franks (1987) described that selecting the most appropriate system is largely a matter of determining which of the performance requirements heads the client's list of priorities.

He listed them down as follows:-

(a) technical complexity
(b) aesthetics or prestige
(c) economy
(d) time "of essence"
(e) exceptional size or complexity.

Naoum (1989), analyzed the clients and revealed that their needs differ substantially in relation to the type of business and the experience that the client has of the building industry. This generates different expectations and criteria for achieving satisfaction with respect to cost, time and quality, and consequently, influence the selection of the procurement system. Naoum (1989) gave the example of property developers and commercial clients.

These clients are likely to place great emphasis upon the speed of the construction because of the necessity to borrow money. Yet the quality will be equally important for the building cannot be sold or let if it is not appropriate to the market. In contrast, Naoum (1989) writes that the public sector client, because of public accountability, is likely to focus upon cost prediction and will be more concerned about the level of certainty associated with the tender sum. Probably, that is the reason behind Hindle's (1993) comment that the traditional system has been held in place the public sector clients who use competitive methods of procurement selection for the purposed accountability.

Franks (1990) carried out a survey of 50 clients during October and November, 1989 to ascertain the nature of their needs and expectations. In the questionnaires distributed suggestions of priorities were on technical complexity, aesthetics or prestige, economy, time of essence, exceptional size, price certainty at an early stage and facility for variations. Figure 4.3 below, shows that economy and time were the priorities of most clients. Price certainty at an early stage in the development of the project's design was the next most important priority.

1	2	3	4	5	6	7	8	9	10	11
		Groups								
Priority	Ranking	A	B	C	D	E	Total	Ranking	Total	Ranking
Technical	1	-	-	-	-	4	4	4		
complexity	2	6	-	-	-	-	6	5		
	3	2	-	-	-	-	4	6	14	6
Aesthetics/	1	12	10	-	-	-	22	2		
prestige	2	4	2	-	-	2	8	4		
	3	10	-	2	2	-	14	=3	44	4
Economy	1	12	4	2	2	4	24	1		
	2	10	4	2	6	4	26	1		
	3	6	4	2	2	-	14	=3	64	=1
Time of	1	12	4	-	-	2	18	4		
essence	2	10	6	2	2	-	20	2		
	3	14	4	2	4	2	26	1	64	=1
Price	1	10	-	2	6	2	20	3		
certainty	2	12	-	2	-	4	18	3		
	3	12	4	-	-	2	18	2	56	3
Facility for	1	-	-	-	-	-	-	=6		
variations	2	4	-	-	-	-	4	6		
	3	4	4	-	-	4	12	5	16	5
Exceptional	1	-	-	-	-	-	-	=6		
size	2	-	-	-	-	-	-	7		
	3	2	-	-	-	-	2	7	2	7

Figure 4.2: Clients' priorities (Franks, 1990)

With regard to expectations, Franks (1990) noted the majority of clients expected to be involved in running the project during both the design and construction stage. However, the extent to which they wanted to be involved was difficult to ascertain.

Further explanation by Franks (1990) was that, whatever the reason for their involvement, many clients' experience led them to expect involvement at both design and construction stages. They may not have wished to have been involved over such a long period of time but they had expected it.

According to Turner (1990), the procurement route that is appropriate to the overall balance of objectives and to client priorities for each project should arise from those objectives and priorities. The appropriateness in the assessment of which route to choose should be made from the client's point of view. Turner (1990) made reference to the NEDO Report (1984), "Thinking About Building" as a guide for assessment of a client's priorities.

The Report set down eight Procurement Assessment Criteria (PAC), from which Clients priorities could be formulated. These are as follows:-

1. Timing
2. Controllable variations
3. Complexity
4. Quality level
5. Price certainty
6. Competition
7. Responsibility
8. Risk avoidance.

According to Masterman (1992), the client's primary needs for project satisfaction remain the classic trio of time, cost and functionality/quality. However, he elaborated that these three basic needs do not reflect the more subtle, numerous and important secondary criteria. He gave an example of the criteria, time, which for the great majority of clients meant "certainty of completion date" rather than the "shortest design and construction period". While to the uninitiated the latter criterion might appear more important than the former, many clients of the building industry realize that guaranteed completion dates enable them to make firm arrangements for the occupation of the building, and commencement of the profit-making activities.

What might start out as theoretical, the shortest possible design and construction period could possibly be considerably extended in practice. To that end, Masterman (1992) identified the following to be the most common secondary needs:-

1. Time
   (a) certainty of completion date and other time related estimates
   (b) early commencement of construction work
   (c) design proposal to be submitted expeditiously
   (d) rapid rectification of defects

2. Cost
   (a) certainty of cost estimates
   (b) value for money, that is, functionality and quality at right price
   (c) ease of accountability
   (d) lowest possible tender
   (e) reduction and/or elimination of risks in general and cost and time overruns in particular
   (f) realistic maintenance and running costs

3. Functionality / Quality
   (a) general suitability for the purpose
   (b) reliability and durability of design
   (c) guarantees and after - sales services
   (d) innovative design / high - quality architecture where appropriate

4. General
   (a) desire to be actively involved and informed during currency of project
   (b) clear allocation of responsibility / single - point responsibility
   (c) flexibility to change design during construction
   (d) need for positive and constructive advice from consultants
   (e) fully motivated and co - operative project team - no conflict.

Masterman (1992) in his concluding remarks, established that different categories of Clients have different priorities when selecting secondary criteria. However, he did not attempt to place the listed criteria in a particular order of preference.

Gordon (1994) explained that the first step in the selection process of Building Procurement Systems is to eliminate organizations that obviously do not meet the needs of the project owner. To eliminate inappropriate organizations Gordon (1994) made reference to a list by Ninden (1986) which comprised five building owner's drives or needs. His further elaboration was that the building owners drives or needs which can be used to narrow down the appropriate organization and also help with the procurement selection are construction sophistication, current capabilities, risk aversion, restrictions of the Building Procurement System and other external factors.

According to Masterman and Gameson (1994), the clearity and comprehensiveness of the client's needs and their brief are important in order to ensure a successful choice of the Building Procurement System. They made a reference to the NEDO Report (1975) which suggested that client brief should not only contain the aesthetic and technical criteria for a project, but of equal importance, the primary and secondary objectives in terms of functionality or quality, time and cost. Further reference by Masterman and Gameson (1994), was made to the Wood Report which revealed a consistent demand by Clients to meet the cost, time quality, functionality and aesthetic criteria in order for a project to be considered to be successful.

Morledge and Sharif (1995) suggested that building clients may benefit considerably from the right choice of Building Procurement Systems. Such a choice may be a significant and cost consequential decision and may need to reflect the needs of each individual client. Further to that Bowen, *et al* (1996) were of the opinion that the selection of an appropriate Building Procurement System process is crucial to the attainment of client objectives or needs. They referred these needs to be time, cost and quality.

Masterman and Gameson (1997) explained that client's needs must be established before the primary and secondary objectives of the project can be identified and determined in the selection of Building Procurement Systems. Once this has been done, and a compromise reached on the importance of each of these, then project brief can be prepared and a mode of Building Procurement Systems selection determined.

According to Masterman and Gameson (1997), the following needs appear to be most important to the average Client when choosing the most appropriate procurement system for his or her building project:

. a need to be kept informed and be actively involved at all stages of the project
. a need for certainty of the final cost
. a need for certainty of the day for completion
. a need to achieve value for money; a need to obtain the lowest possible tender.

Love, *et al* (1998) established that a primary issue that is often raised within the building industry relates to what clients want in order to be satisfied with their buildings and the means by which those buildings have been procured. Consequently, they added that it is important to evaluate the client's criteria, their importance and then seek performance to match the criteria. All clients require their buildings to be completed on time, within budget and be of the highest quality. However, some clients stress that certain criteria are more important than others.

Mc Dermott, Melaine and Sheath (1997), in their article "Construction Procurement System: What Choice for the Third World?" considered the selection of procurement systems to be a client centred concept. They cited the Latham Report (1994) that "--- clients are the core of the process and their needs must be met by the building industry". Ambrose and Tucker (1999) explained that the areas of time, cost, accountability and an involvement in the design process are the most common areas of concern for clients.

4. 4 SELECTING A PATH

There is one procurement method that is in some sense "better" than all others for an individual project but that no one procurement method is likely to be better than others for any project. Love, Skitmore and Earl (1998).

According to Skitmore and Marsden (1988), several experts in the building industry have neither found a single person nor knowledgeable "czar" fully conversant with all the main procurement arrangements; nor did they find any general overt consensus between the experts which easily systemises procurement selection. Further to that, no mutually exclusive sets of criteria uniquely and completely determine the appropriate procurement arrangement for a specific project. In support of the above Masterman (1992) explained that the choice of procurement systems is now so wide, and projects are becoming so complex, that the selection process needs to be carried out in a disciplined and objective manner and within the framework of the project strategy and project brief. He elaborated that the brief must contain the client's both the primary and secondary objectives in terms of functionality, quality, time and cost.

However, Masterman (1992) cautioned that there is no "best buy" among procurement systems. Client organizations are complex and different categories of clients require discrete solutions to their procurement needs, added to which the prevailing economic climate often influences the choice of the procurement method. It therefore follows that the choice of system must be made by matching the criteria and objectives of the project brief with the most suitable characteristics of various procurement methods.

Franks (1984) attempted to create a module for selecting a Building Procurement System. He listed five performance requirements (ref figure 4.4) and gave them a rating insofar as each of the basic procurement systems is able to satisfy the requirements. Ratings were given on a 1 to 5 scale with "1" indicating the minimum and "5" maximum capacity to meet the requirements. Franks (1984), assumed that the competence of the personnel involved was similar in all instances and only the systems were being compared.

Management System / Performance Requirements	(1) Traditional	(2) Management for a fee	(3) Package Deal	(4) Contractor's Design (Design and Build)	(5) Separate Contracts	(6) Project Manager
(a) technical complexity	4	3	3	4	4	4
(b) aesthetic/prestige	4	3	1	3	3	3
(c) economy	3	4	4	4	4	5
(d) time is of essence	1	4	4	4	4	4
(e) exceptional size or complexity	2	4	3	4	3	5
TOTAL	**14**	**18**	**15**	**19**	**18**	**21**

Figure 4.3: Rating the alternative systems (Franks, 1984).

In his concluding remarks Franks (1984) explained that a golden rule of making a comparison is that one compares "like with like". This rule precludes extensive valid comparisons of the alternative systems. Each system developed to meet particular client needs. He cautioned that there is no universal system and if one looks for the system which best meets the client's performance requirements in broad terms, the ratings above might provide a guide for ranking. In making such a ranking one must, however, remember that no system can be all things to all men and the ratings are subjective.

"Thinking About Building" (NEDO, 1985) set down eight procurement assessment criteria to guide assessment of a client's priorities (refer figure 4.2). The positions of the dots on the chart portray the characteristics of the construction industry in broad terms.

The procedure is to consider the multiple choice question, noting the number of the answer which comes closest to the mind and ring the dots on the chart along the line with the number. When all questions have been considered, the number of ringed dots in each column are summed up and the procurement paths with the most rings should be worthy of further investigation.

Singh (1985) described a rational procedure for the selection of appropriate project delivery system for building projects. The procedure was based on the weightage factors and priority rating for project's attributes like speed, price certainty , flexibility, quality, complexity, risk avoidance and responsibility, price competition and disputes/arbitration. The relative weightage factors for different contracting systems was established using the expertise/experience of highly placed professionals in the building industry. Singh (1985) established nine project delivery systems which were found to have been used frequently in the United states of America. These were as follows:-

- Negotiated lump sum (A)
- Competitive lump sum (B)
- Negotiated design and build (C)
- Competitive design and build (D)
- Negotiated turnkey (E)
- Competitive turnkey (F)
- Construction management (G)
- Unit rate (H)
- Cost plus fee(I)

In all of the above, eight variables were considered for establishing the utility factors. These were as follows:

- Speed (both during design and construction)
- Certainty (including the reliability of both the original price and the stipulated time and knowledge of exactly how much the Client has to pay at each period during the construction phase)

- Flexibility (in accommodating design changes)
- Quality level (including aesthetics, confidence in design and flexibility in accommodating design input by the client)
- Complexity
- Risk avoidance and responsibility (including client involvement and design liability
- Price competition (covering such issues as value for money, maintenance costs and competitive tendering
- Disputes and arbitrations.

According to Singh (1985), a scale of 10 - 110 was to be adopted for each of the variables considered so as to provide flexibility in making the relative performance of different contracting systems. (refer figure 4.5 below)

SPEED

(considering both during design & construction)

CERTAINTY

(including the reliability of both the original price & the stipulated time and knowledge of exactly how much the client has to pay at each period during the construction phase)

COMPLEXITY

RISK AVOIDANCE AND RESPONSIBILITY

(including client involvement and design liability)

110+
+
90+
+
70+
+
50+
+
30+
+
10+

FLEXIBILITY

(in accommodating design changes)

QUALITY LEVEL

(including aesthetics, confidence in design, flexibility in accommodating design input by the client)

PRICE COMPETITION

(covering such issue as value for money, maintenance costs and competitive tendering)

DISPUTES & ARBITRATIONS

Figure 4.4: Parameters, to investigate the performance of Project Delivery Systems, on a Numerical scale (Singh, 1985).

A procedure for the selection of appropriate project delivery system is illustrated in the decision chart (table 2) and is completed as follows:-

(a) The user reads all the priority questions and enters the relative importance of each variable in the chart on a scale of 1 to 20.

(b) Rationalized priority ratings are computed (by dividing each of the priority ratings by the sum of all the ratings), and then entered into the chart. The sum of the rationalized priority ratings should always be equal to 1.

(c) Each rationalized priority rating is taken in turn and multiplied by each of the utility, factors, the results being entered into the appropriate columns.

(d) The totals of each of the results columns, under each project delivery system, are calculated and ranked in the descending order. The best project delivery system should have the highest total result.

TABLE 2. Decision Chart for a Hypothetical Project viz An Industrial Building to commence production as soon as Possible

Clients priority questions	clients priority rating	Client's priority rating	Project Delivery Systems A Competitive Lump sum		B Competitive Lump sum		C Negotiated Design & Bond	
			Utility factor	Result	Utility factor	Result	Utility factor	Result
1. SPEED How important is early completion to the success of your project	20	0.21	67.9	14.3	47.7	10.0	95.0	20.0
2. CERTAINTY Do you require a firm price and/or a strict completion time date for the project before you can commit yourself to proceed with construction?	18	0.19	92.3	17.5	17.5	90.9	81.6	15.5
3. FLEXIBILITY To what degree do you foresee the need to alter the project in any way once it has begun on site?	5	0.05	58.9	1.0	44.6	2.2	70.3	3.6
4. QUALITY LEVEL What level of quality, aesthetic appearance do you require in the design and workmanship?	7	0.07	75.8	5.3	70.9	5.0	08.4	4.8
5. COMPLEXITY Does your building need to be highly specialized, technolo-cally advanced or highly serviced	3	0.03	93.7	2.8	91.3	2.7	83.5	2.5
6. RISK AVOIDANCE AND RESPONSIBILITY To what extent do you wish one single organization to be responsible for the project or to transfer the risks of cost and time slippage?	17	0.18	76.0	13.7	79.1	14.2	79.1	14.2
7. PRICE COMPETITION Is it important for you to Choose your construction Team by price completion., so increasing the likelihood of a low price?	10	0.11	76.7	8.4	99.3	10.9	67.6	7.4
8. DISPUTES AND ARBITRATIONS To what extent do you Want to avoid disputes/ Arbitrations?	15	0.16	94.2	15.1	04.8	13.6	81.8	13.1
Totals	**95**	**1.00**		**80.1**		**75.6**		**81.1**
Rank Order				2		4		1

Source: Singh, 1985

TABLE 2. Decision Chart for a Hypothetical Project viz An Industrial Building to commence production as soon as Possible

Clients priority Questions	clients priority rating	Client's priority rating	Project Delivery Systems D Competitive Lump sum Utility Result Factor		E Competitive Lump sum Utility Result factor		F Mospated Design & Bond Utility Result factor		G Construction Manage-Ment		H Unit Rate		I Cost Plus Fee	
1. SPEED How important is early Completion to the Success of your project	20	0.21	73.3	15.4	86.1	18.1	68.4	14.4	76.1	16.0	62.6	13.2	73.7	15.5
2. CERTAINTY Do you require a Firm price and/or a Strict completion Time date for the project Before you can commit Yourself to proceed with construction?	18	0.19	81.9	15.6	79.5	15.1	78.7	15.0	65.9	12.5	37.9	7.2	19.1	7.4
3. FLEXIBILITY To what degree do you foresee the need to alter the project in any way once it has begun on site?	5	0.05	98.2	2.9	58.1	2.9	52.9	2.7	84.5	4.2	87.0	4.4	96.6	4.8
4. QUALITY LEVEL What level of quality, aesthetic appearance do you require in the design and workmanship?	7	0.07	63.2	4.4	65.5	4.6	58.6	4.1	81.6	5.7	65.0	4.6	85.6	6.0
5. COMPLEXITY Does your building need to be highly specialized, technologically advanced or highly serviced	3	0.03	81.1	2.4	73.5	2.2	72.4	2.2	63.2	1.9	51.5	1.6	51.7	1.6
6. RISK AVOIDANCE AND RESPONSIBILITY To what extent do you wish one single organization to be responsible for the project or to transfer the risks of cost and time slippage?	17	0.18	82.6	14.9	75.6	13.6	79.0	14.2	63.3	11.4	33.9	6.1	39.6	7.1
7. PRINCE COMPETITION Is it important for you to choose your construction team by price completion., so increasing the likelihood of a low price?	10	0.11	84.7	9.3	64.1	7.1	77.0	8.5	64.0	7.0	41.3	4.5	44.7	4.9
8. DISPUTES AND ARBITRATIONS To what extent do you want to avoid disputes/ arbitrations?	15	73.16	11.8		72.8	11.6	66.9	10.7	65.9	10.5	56.1	9.0	58.8	9.4
Total		**76.7**			**75.2**		**71.8**		**69.2**		**50.6**		**56.7**	
Rank Order		3			5		6		7		9		8	

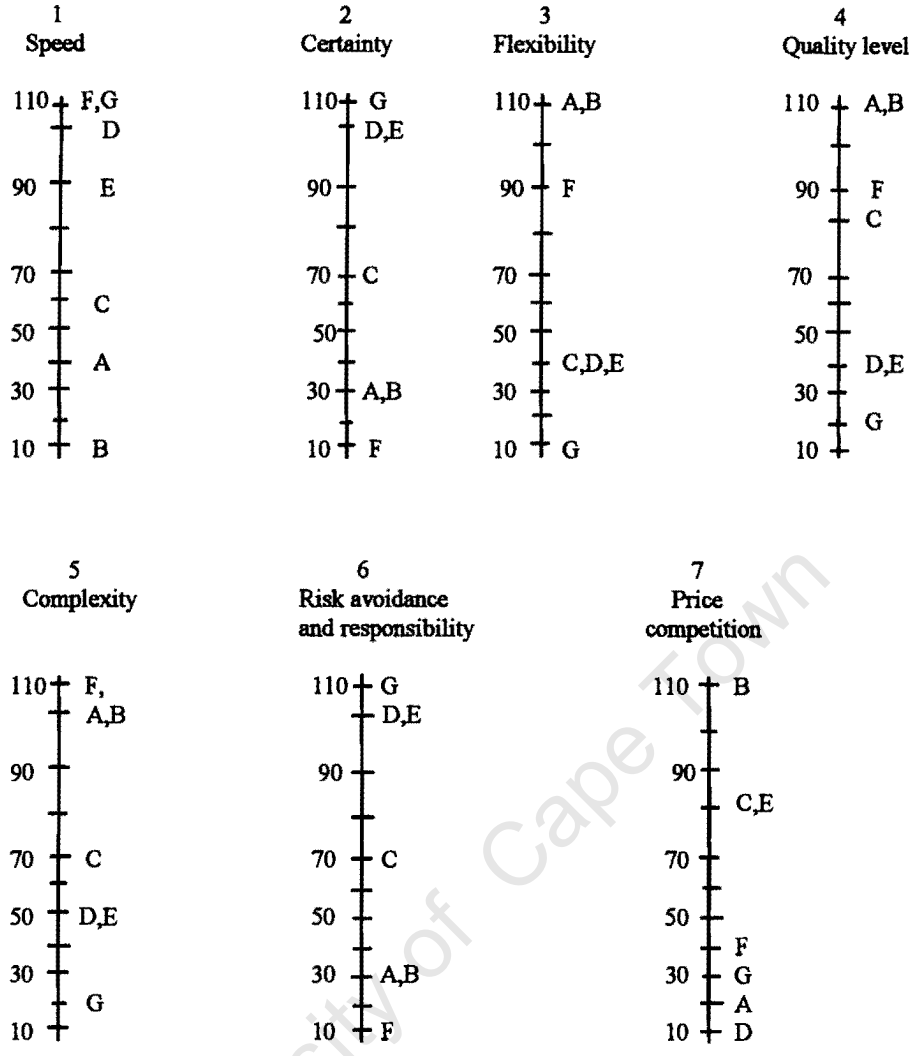
Source: Singh, 1985

Singh (1985) in his concluding remarks noted that the above model (decision chart), provides a rational procedure for the selection of an appropriate contracting system for a given project for clients.

Skitmore and Marsden (1988) explained that the proliferation of differing procurement arrangements for new buildings resulted in an increasing demand for systematic methods of selecting the most appropriate arrangement for a particular project. They identified two approaches which could aid the selection of the most appropriate arrangements for a building project. The first was a multi-attribute technique based on the NEDO procurement path decision chart. The second approach was by means of discriminant analysis.

Skitmore and Marsden (1988) noted that the multi-attribute approach, based on the original NEDO chart, had two major deficiencies. First, the criterion answers were restricted to, at most, three alternatives. They, therefore, altered the original NEDO chart to allow a priority rating on a continuous scale, so giving a more precise measure. Secondly, the NEDO method implied that all criteria are of equal importance, irrespective of priority ratings, in identifying the most appropriate path. They commented that each procurement arrangement may have a differing degree of relevance to each priority, relative to other procurement paths.

Further to the above, Skitmore and Marsden (1988) explained that by indicating the relative utility of each procurement path against each criterion on a numerical scale, it was possible to obtain a set of utility factors for use in the decision chart. The utility factors are in effect a relative measure of the suitability of a certain procurement path for a given criterion. They used an example of the method for scoring the utility factors as indicated on the lines of Fellows and Langford (1980), (as illustrated below).



Key:
A Negotiated traditional
B Competitive traditional
C Develop and construct (competitive)
D Negotiated design and build
E Competitive design and build
F Management contracting
G Turkey contracting

Adapted from Fellows and Langford (1980)

Fig. 4.5. Method of scoring utility factors. (Skitmore and Marsden, 1988)

Each procurement path (A,B,---G) was associated with a criterion set score (1,2,---7) and on a scale of 10 to 110 to avoid any possible imbalance due the occurrence of zeros. The mode of chart completion by Skitmore and Marsden (1988), is similar to that explained by Singh (1985).

Hypothetical project 1: Industrialist requiring industrial unit quickly to realize grant and commence production as soon as possible (using provisional utility factors).

Client's priority questions	Client's priority (Scale 1 20)	Rational-rating priority rating	Procurement Paths A: Negotiated traditionalized Utility factor	A Result	B: Competitive Competitive traditional Utility factor	B Result	C: Negotiated develop and construct Utility factor	C Result	D: Competitive design and build Utility factor	D Result	E: design and build Utility factor	E Result	F: Management contracting Utility factor	F Result	G: Turnkey contracting Utility factor	G Res
1 SPEED																
How important is early completion to the success of your project	20	0.25	40	100	10	2.5	60	15.0	100	25.0	90	22.5	110	27.5	110	27.5
2 CERTAINTY Do you require a firm price and/or a strict completion date for the project before you commit yourself to proceed with construction?	18	0.22	30	6.6	30	6.6	70	15.4	100	22.0	100	22.0	10	2.2	110	24.2
3 FLEXIBILITY To what degree do you foresee the need to alter the project in any way once it has began on site	5	0.06	110	6.6	110	6.6	40	2.4	40	2.4	40	2.4	90	5.4	10	0.6
4 QUALITY LEVEL What level of quality; aesthetic appearance do you require in the design and workmanship?	7	0.09	110	9.9	110	9.9	80	7.2	40	3.6	40	3.6	90	8.1	20	1.8
5 COMPLEXITY Does your building need to be highly specialized, tech-no logically advanced or highly services?	3	0.04	100	4.0	100	4.0	70	2.8	50	2.0	50	2.0	110	4.4	20	0.8
6 RISK AVOIDANCE AND RESPONSIBILITY To what extent do you wish one single organization to be responsible for the project, or to transfer the risks of cost and time slippage?	17	0.21	30	6.3	30	6.3	70	14.7	100	21.0	100	21.0	10	2.1	110	23.1
7 PRICE COMPETITION It important for you to choose your construction team by price competition, so increasing the likelihood of a low price?	10	0.31	20	2.6	110	14.3	80	10.4	10	1.3	80	10.4	40	5.2	30	3.9
Totals	80	1.00		46.0		50.2		67.9		77.3		83.9		54.9		81.9
Rank order				7		6		4		3		1		5		2

Fig. 4.6 Procurement path decision chart: preliminary testing. (Skitmore and Marsden, 1988)

Skitmore and Marsden (1988) in their attempt to formulate a universal procurement selection technique, devised another method of selection based upon discriminant analysis. This method examined data collected under a set of criteria (discriminating variables), which were the characteristics of which the various procurement systems differed; using these criteria the researchers were able to discriminate between procurement paths for decision making purposes.

According to Skitmore and Marsden (1988), the discriminant analysis method proved to be successful in trials and should in theory be more reliable due to its use of more of the available information. Nonetheless, in practice the fact that it relies on the use of an advanced statistical technique, involving a great deal of tedious calculations, probably renders it unsuitable for most clients (Masterman and Gameson, 1997).

Skitmore and Marsden (1988) were of the opinion that a multi-attribute analysis technique developed from the NEDO procurement path decision chart and discriminant approach on the evidence of the trial data give identical and intuitively, satisfactory answers. They added that both methods represents an important advance in accommodating both the disparate view of experts and the interdependence of criteria.

Brandon, Basden, Hamilton and Stockley (1988) explained another procurement selection guide using a computer system package known as ELSIE released by the RICS in 1988. They revealed that the BEDC pamphlet "Thinking About Building" was taken as a starting point for their study of procurement path selection. The programme provides recommendations on the most appropriate procurement systems.
Further explanation by Brandon, Basden, Hamilton and Stockley (1988) is that the ELSIE system is capable of dealing with probability rather than certainty. The ELSIE System provides guidance on the suitability of five basic procurement systems, viz:

1. conventional
2. two - stage conventional
3. contractor design and build
4. management contracting
5. construction management

Once the system has been accessed via the microcomputer, a series of questions are posed on the screen which require the user to provide information about the project in relation to:

1. the quality of the client's brief
2. the timing of the project
3. the level of quality required
4. the complexity of the building services installation
5. the nature of the design
6. the need for specialist construction methods or materials
7. the acceptable level of uncertainty on price
8. the need for changes during the construction period

Once all of the relevant questions have been answered, and an evaluation of the information made by the system, recommendations are given on a result screen. The summary contains two elements of information:

1. a list of the most appropriate procurement systems ranked in order of suitability
2. an indication of the extent to which the various systems will satisfy the client's requirements.


```
----  PROCUREMENT  METHOD  SUITABILITY  ----
Very likely to be appropriate:
    -- Conventional --

May not be appropriate:
    -- Two – stage conventional --

Very unlikely to be appropriate:
    -- Management Contract - -
    -- Construction Management - -
    *** EXCLUDED (INDEPENDENT DESIGN CONSULTANTS REQUIRED) ***
    -- Design - &- Build --

Type <CR> to continue
```

Figure 4.7 Results screen (Elsie procurement Module; Brandon et al 1988)

Bennett and Grice (1990) used both the "Thinking About Building" (NEDO, 1985) guide and Skitmore and Marsden's (1988) work to tabulate the strengths and weaknesses of the various procurement systems (table 3).

According to them the table provides an opportunity for clients to weight the various criteria in order to reflect their priorities. The authors stress the need to determine the priority given to the project's objectives by means of a detailed discussion of the issues involved between the client and his adviser and the fact that the utility factors allocated to each procurement system should be reviewed in the light of the characteristics of both the client and the project. They pointed out that the circumstances of a specific project or client may result in the need to pose different or additional questions, or amended utility factors before the form is completed as shown in Table 4 and the choice of procurement system is made.

Table 3 Example of procurement - system selection

	Client's priority:		*Procurement systems*														
			Traditional				*Design and build*				*Management*						*Design and manage*
	Essential	5 4	*Sequential*		*Accelerated*		*Direct*		*Competitive*		*Develop and construct*		*Management contracting*		*Construction management*		*Contractor*
	Desirable	3 2															
	Do without	1	*Utility*	*Score*	*Utility*	*Score*	*Utility*	*Score*	*Utility*	*Score*	*Utility*	*Score*	*Utility*	*Score*	*Utility*	*Score*	*Utility*
Score																	
Time																	
Is early completion required?			10	50	100	90	60	100	100	90	80						
Cost																	
Is a firm price needed before any commitment to construction is formed?			90	40	100	100	90	20	10	30	20						
Flexibility																	
Are variations necessary after work has begun on site?			100	90	30	30	40	80	90	60	70						
Complexity																	
Is the building highly specialized, technologically advanced or highly serviced?			40	20	20	10	40	100	100	70	80						
Quality																	
Is high quality important?			100	60	40	40	70	90	100	50	60						
Certainty																	
Is completion on time important?			50	30	100	90	70	90	90	100	90						
Is completion within budget important?			30	30	100	100	50	70	60	90	90						
Division of responsibility																	
Is single - point responsibility wanted?			30	30	100	100	70	30	10	90	90						
Is direct professional responsibility wanted?			100	100	10	10	50	70	100	30	30						
Risk																	
Is transfer of responsibility for the consequence of slippages important?			30	30	80	100	70	30	10	100	80						
Results																	

Source: Bennett and Grice, (1990)

Table 4 Example of procurement - system selection

Procurement systems

Consultant	Client's priority: Essential 5 / 4 / Desirable 3 / 2 / Do without 1	Traditional				Design and build				Management				Design and manage			
		Sequential		Accelerated		Direct		Competitive		Develop and construct		Management contracting		Construction management		Contractor	
		Utility	Score	Utility	Score	Utility	Score	Utility	Score	Utility	Score	Utility	Score	Utility	Score	Utility	Score
Time																	
Is early completion required?	2	10	20	50	100	100	200	90	180	60	120	100	200	100	200	90	180
Cost																	
Is a firm price needed before any commitment to construction is formed?	2	90	180	40	80	100	200	100	200	90	180	20	40	10	20	30	60
Flexibility																	
Are variations necessary after work has begun on site?	5	100	500	90	450	30	150	30	150	40	200	80	400	90	450	60	300
Complexity																	
Is the building highly specialized, technologically advanced or highly serviced?		40	200	20	100	20	100	10	50	40	200	100	500	100	500	70	350
Quality																	
Is high quality important?	5	100	500	60	300	40	200	40	200	70	350	90	450	100	500	50	250
Certainty																	
Is completion on time important?	3	50	150	30	90	100	300	90	270	70	210	90	270	90	270	100	300
Is completion within budget important?	2	30	60	30	60	100	200	100	200	50	200	50	100	70	140	60	120
Division of responsibility																	
Is single - point responsibility wanted?	1	30	30	30	30	100	100	100	100	70	70	30	30	10	10	90	90
Is direct professional responsibility wanted?	3	100	300	100	300	10	30	10	30	50	150	70	210	100	300	30	90
Risk																	
Is transfer of responsibility for the consequence of slippages important?	3	30	90	30	90	80	240	100	300	70	210	30	90	10	30	100	300
Results		2030		1600		1720		1680		1790		2330		2400		2100	

Source: Bennett and Grice, (1990)

Franks (1990) maintained his approach of selecting procurement systems by rating different procurement systems against performance requirements. However, unlike in 1984 when the list outlined only five performance criteria, the expansion was made to include price certainty and facility for change by users during the progress of the works.

Furthermore, Franks (1990), reduces the number of procurement systems from six to only four. This was done by combining those procurement systems having identical / similar implementation characteristics.

Management system Client's performance Requirements/expectations	Traditional	Management Contracting/ Construction Management	package deal/design-and build	project manager/ client's representative
(a) technical complexity; the project has a high level of structural mechanical services or other complexity.	4	5	4	5
(b) high aesthetic or prestige requirements	5	3	3	4
(c) economy; a commercial or industrial project or project where minimum cost is required.	3	4	4	4
(d) time is of essence; early completion of the project is require.	2	4	5	4
(e) exceptional size and / or administrative complexity, involving varying client's/user requirements, political sensitivity etc.	2	4	4	5
(f) price certainty; is required at an early stage in the project's design development	4	2	4	4
(g) facility for change/variation control by client, users or others during the progress of the works.	5	5	1	4

Figure 4.8 Rating the systems (Franks, 1990)

Turner (1990), commended "Thinking About Building" (NEDO 1985), that had adequately set down eight Procurement Assessment Criteria (PAC), to guide assessment of the client's priorities. However, he was of the opinion that by definition priorities cannot be equal and cannot be equally satisfied.

He suggested that, the discipline of forming a rank order and possibly having some assessment is probably necessary for other than the most simple procurement decisions, in order to choose from the procurement arrangement options.

Turner (1990) suggested that before choosing a procurement route the following has to be done:-

- all procurement assessment criteria should be explored
- a priority listing should be made, principally to establish a balance between programme, price and product quality.
- a formal assessment system may be appropriate
- it may be useful to place the procurement arrangement option in rank order, for project record purpose.
- organisations capable of carrying out the procurement arrangement option that has been chosen should be known to be available to the client in order to satisfy the procurement arrangement option chosen.

Turner (1990) suggested the use of figure 4.9 as he reproduced it from the NEDO report (1984) "Thinking about Building" to be the appropriate in the evaluation of clients priorities and classification of procurement paths.

Birrell (1991) gave out a general comment that the choice of the procurement approach for every future building project should be made as a specific choice to match primarily the needs of the clients. He suggested that this important choice should be made rationally and objectively as the choice of one approach from an array of approaches can affect the processes of design, contracting and construction which in turn affects the quality, cost and duration of the building project. A further suggestion by Birrell (1991), was that making the choice of which procurement approach is most appropriate to the project should be by considering factors grouped under the client's objectives from the procurement process, the nature of the client, the nature of the current, local construction marketplace and prevailing conditions as well as features of the physical building.

A Timing	How important is early completion to the success of your project?	Crucial
		Important
		Not as important as other factors
B Controllable variation	Do you foresee the need to alter the project in any way once it has begun on site, for example to update machinery layouts?	Yes
		Definitely not
C Complexity	Does your building (as distinct from what goes in it) need to be technically advanced or highly serviced?	Yes
		Moderately so
		No, just simple
D Quality level	What level of quality do you seek in the design and workmanship?	Basic competence
		Good but not special
		Prestige
E Price certainty	Do you need to have a firm price for the project construction before you can commit it to proceed?	Yes
		A target plus or minus will do
F Competition	Do you need to choose your construction team by price competition?	Certainly for all construction work
		Construction and management teams
		No, other factors more important
GI Responsibility Division of	Can you manage separate consultancies and contractors, or do you want just one firm to be responsible after the briefing stage?	Can manage separate firms
		Must have only one firm for everything
GII Responsibility Professional	Do you want direct professional responsibility to you from the designers and cost consultants?	Not important
		Yes
H Risk avoidance	Do you want to pay someone to take the risk of cost and time slippage from you?	No, prefer to retain risk and therefore control
		Prepared to share agreed risks
		Yes

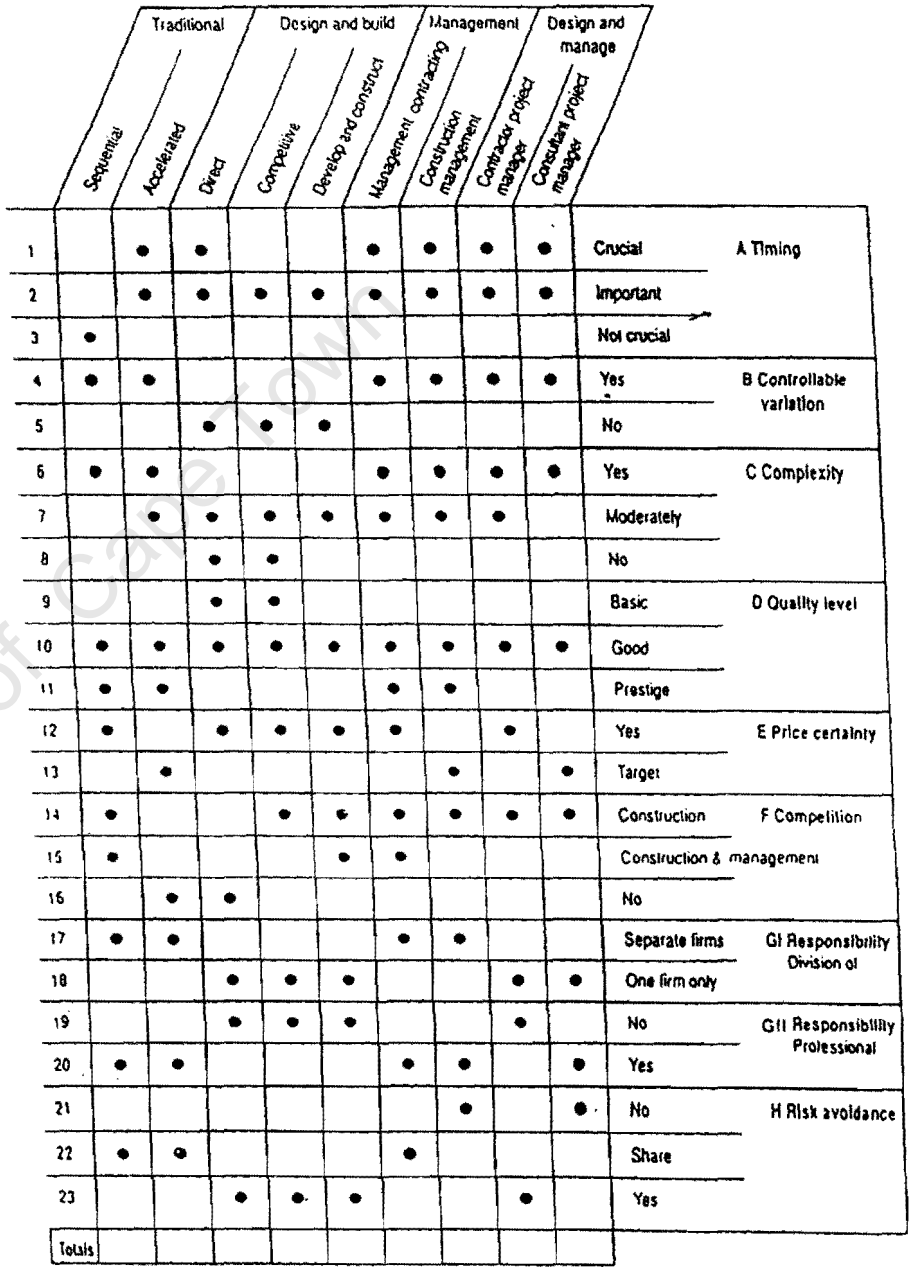


Figure 4.9 Identifying your priorities (Turner, 1990)

Masterman (1992) reviewed various guides and aids to the selection of procurement systems as presented by different authors, researches and research institutions. His comments on the selection proposal by Skitmore and Marsden (1988), utilizing the discriminant technique was that this approach involves the use of a fairly advanced statistical technique, requires the use of complex computer software and can be time consuming. He therefore suggested that, despite its apparent success, this technique is unlikely to be suitable for use by busy clients and consultants until it becomes more "user friendly".

Masterman's (1992) comment on the selection of procurement systems as suggested by Franks (1990), was that the inclusion of "project management" amongst a list of procurement system is considered to be ill - advised. However, he agreed that the principle of using a method of rating the individual characteristics of the various methods against a list of client's needs is valid and he considered it to be the first step in applying logic and discipline to the selection process.

According to Masterman (1992), "Thinking About Building" (NEDO , 1985), by simply answering the questions that are posed on the chart, the most apparently appropriate procurement system(s) can be identified and given further consideration. However, he was of the opinion that, whilst the NEDO (1985) guide could be useful in terms of eliminating unsuitable procurement systems from all of the available alternatives, it is not sophisticated enough to enable a final decision to be taken as to the most appropriate method of designing and constructing the project being examined.

Masterman (1992) suggested that, the selection methods proposed by Bennett and Grice, and the ELSIE computer system would appear to provide the most accessible and useful guidance. However, he cautioned that the latter system is heavily conditioned and should only therefore be used as a basis for further consideration. Further to that, he explained that when using any of these aids inexperienced clients should obtain advice from experienced consultants.

Masterman and Gameson (1997) observed that the selection process has become increasingly complex, mainly as a result of the continuing proliferation of alternatives for procuring building projects and their ever increasing technical complexity. Also, the client's continuing desire for speedy commencement and completion has led to the demand for more sophisticated methods of selection being devised.

Love, *et al* (1998) followed the approach proposed by Singh (1985), and Skitmore and Marsden (1988), in selecting the procurement systems. The approach was based on the weightage factors and priority ratings. According to them different clients and different project circumstances demand different criteria weights. For example, if, for one project, the cost is the most important aspect, then they weighted the "cost" criterion higher than the other criteria. For another project where the speed of construction was considered the most important, they suggested to weigh the "speed" criterion higher than the rest.

The procedure adopted by Love, *et al* (1998) for obtaining client priority weightings for each criterion follows Singh (1985), and Skitmore and Marsden (1988). At the end rationalized priority rating - utility factor products are added for each procurement method and the resulting total ranked in descending order. The most appropriate procurement method is taken to the one with the highest total.

4. 5 SUMMARY

Aspect of categorisation of clients has identified two basic classic categories, that is, public and private organisations. A subdivision of the above categories exist and this relates to the experience of clients in implementing building projects, thus, "experienced" and "inexperienced" divisions. The relationship of the client's business activities to the completed building project provided a further subdivision of clients. To this end primary constructors and secondary constructors were identified.

As for as clients needs are concerned the following seems to be common to majority of the Clients

- Timing
- Controllable variations
- Complexity
- Quality level
- Price certainty
- Competition
- Responsibility, and
- Risk avoidance.

Concerning selection of Building Procurement System, once the client's objectives have been established and incorporated into the project brief, all potentially appropriate procurement systems need to be identified so that the characteristics of these methods can be compared with the requirements of the brief, and to select the most suitable system some authors tried to use a rating.

The selection process has become increasingly complex, mainly as a result of the continuing proliferation of alternative methods for procuring building projects, their ever increasing technical complexity and client's continuing desire for speedy commencement and completion, all of which has led to the demand for more sophiscated methods of selection being devised.

However, the path suggested by NEDO (Thinking About Building) appears to provide the most accessible and useful guidance towards selection of appropriate procurement system. Majority of the authors in this section have supported it and others are proposing few modification but all revolving around it. The guidance both summarise the characteristics of the most common procurement systems and provide a crude means of reducing the possible alternatives to a manageable number. This in fact will be used in chapter five to conduct client's needs and priorities surveys to individual case studies.

A rating system based on the ability of each procurement system to meet seven common satisfying criteria. A scale of 1-5 was used, where 1 is the minimum and 5 is the maximum. Nonetheless, there are other authors who believe that the use of this technique in determining clients' needs is valid, but is flawed with subjectivity.

Another school of thought was to use the multi- attribute approach, which is a technique applied to measure a degree of objectivity to subjective areas. These studies adopted the procurement path decision chart to aid the decision-making process. Others applied concordance analysis and discriminant analysis to their theoretical framework. Concordance analysis is used to measure the consistency of experts' ranking for each procurement against set predetermined criterion.

Discriminant analysis examined data collected under a set of criteria which have characteristics on which the various procurement methods are expected to differ. Thus, procurement paths could be discriminated against for decision-making purposes. A final analysis found from the exploratory work that the multi-attribute approach gave similar results to those of discriminant analysis.

The procurement module of the 'Elsie' expert system computer package provides the recommendations on the most appropriate procurement method via a software programme. A series of questions relating to the timing, quality, design cost parameters and other characteristics of the project is posed by the program. On evaluation of the information, recommendations are given by means of a list of the most appropriate methods, ranked in order of suitability, together with an indication of the extent to which the various methods will satisfy the client requirements.

Nonetheless, despite the fact that the "Elsie" module was developed way back in 1988 few researchers and authors have written about its use. In the course of discussion between the candidate and Professor P. Bowen of the University of Cape Town on 12th August, 1999 at UCT, Professor Bowen commented that "... may be the Elsie module is for practitioners and that is why academicians and researchers have not commented on it"

CHAPTER FIVE

APPLICATION OF BUILDING PROCUREMENT SYSTEMS IN TANZANIA: CASE STUDIES AND OTHER SURVEYS

5.1 INTRODUCTION

This chapter reports the results of case studies, interviews and other surveys. Initially it was intended that the research objectives were to be pursued through the use of case studies. Clients survey was intended to test the appropriateness of the Building Procurement System used for each case study project. Subsequently, it was decided that a second survey would be undertaken to improve the sample size and focus on change in the use of BPS. These will be described here and referred to as:

- the case studies
- the client's survey
- the consultant's survey.

Sample size and selection process: This research is based upon the results obtained from ten case studies. These case studies include randomly selected projects from both the public and private sector. All ten projects were implemented either in Arusha or Dar es Salaam, the two main cities in Tanzania. The two cities were selected based on their merits to have attracted more that 50 per cent of capital expenditure as for as building industry is concerned. Arusha is currently commanding attraction in construction due to its strategic location in terms of tourism (Serengeti, Ngorongoro, Manyara, Tarangire and Momella national parks and Mount Kilimanjaro), mining (Mbuguni and Meralani) and diplomatic centres (International Criminal Tribunal for Rwanda, African Wildlife Foundation, World Vision and East African Co-operation).

On the other hand, despite the government effort to transfer its headquarters to Dodoma (central part of Tanzania) for the past 25 years Dar es Salaam has remained the capital city of Tanzania (only one ministry out of 20 ministries has moved to Dodoma).

According to the information gathered from Dar es Salaam City Commission, during the previous five years a total of five building permits were issued for the construction of large upper market office blocks, two of which are covered as case studies B and C. As far as residential estates are concerned three building permits were issued during the same period and this includes case study F.

The Arusha Municipal Council confirmed that during the past five years three building permits were issued for office buildings (including case studies A and E), one permit for a bank (that is case study D) and four permits for large housing estate (case study H).

Case studies G and I are foreign funded projects and being government properties are not subjected to the application of building permits. Arithmetically this study covered six out of Sixteen construction projects carried out in the cities of Arusha and Dar es Salaam. This represents approximately 40 per cent of building projects carried out in the two cities for the previous five years. Therefore, these case studies can be assumed to be a fair representation of major building activities carried out in Tanzania.

As it is explained herein before it was later decided that consultants survey was to be undertaken. This was necessary to supplement the finding of the case studies as far as failure of TBPS is concerned and determine consultants knowledge with respect to the new BPS. This survey was carried out to owners or senior representatives of 14 out 33 registered architectural firms in Tanzania. Out of 14 consultants offices surveyed only five are covered in the case studies and this makes a total number of architectural firms included in this research to be 19 of 33 offices. This represents approximately 60 per cent of all architectural firms in the country.

5.2 CASE STUDIES

An identical questionnaire (as indicated in appendix I) was sent to clients covered in all ten case studies. The questionnaire was designed to establish if the client ever used the TBPS, the system being used now and asked the reason for change, if there is any, from the TBPS. Furthermore the questionnaire was meant to enquiry as to who decided the BPS being used in the studied cases, what criteria used and if they were satisfied with results of the systems.

Similarly, an identical questionnaire (as indicated in appendix II) was sent to consultants covered in all ten case studies. The design of the questionnaire was aimed at gathering information related to their knowledge of different BPS and how they acquired that knowledge. Other questions were to establish which BPS was used in each case study, if they advised client which system to use and why. Also it was to establish if they have any preferred BPS. Furthermore, questionnaire to consultants was to investigate if the TBPS is being used less these days than in the past.

Persons are more likely to respond to a questionnaire to the degree that their anonymity is maintained or guaranteed. The respondents, both clients and consultants, were given option of giving their particulars or remain anonymous.

Case study A: The project is an office block for a parastatal organisation. The site is a piece of land within the Arusha Municipality, north of Tanzania. According to both the client and the consultant the Traditional Building Procurement System was used. The contract sum was Tshs. 4,230,000,000 (approximately USD 5,287,500) for two phases at 1999 prices and a 65 weeks completion period was agreed for phase I and 104 weeks for phase II.

From the questionnaire completed by the client's representative the following were noted.

- The system being used in this project is not different from the TBPS.
- He does not have any other system to compare with the TBPS in terms of time, cost and quality deliveries.
- He usually decides which Building Procurement System to be used.
- He decided to use the TBPS in this case because it is the only one they are conversant with.
- He would like to see the introduction of other Building Procurement Systems so as to measure their effectiveness in the building industry.

The questionnaire for consultants in this case was sent to the Architect of the same project who responded as follows:-

. He is aware of the following Building Procurement Systems:
    - Traditional System.
    - Design and Build.
. He learnt about the above systems in School of Architecture for the TBPS and in books and journals for Design and Build.
. In this case the TBPS was used but they did not advise the client as to which system should be used.
. He prefers to use Design and Build because it is flexible and it gives room for decision making without going through a whole range of bureaucratic procedure.
. He does not have working experience with the Design and Build system but relies on explanations in books.
. The TBPS is being used less often these days than in the past because of bureaucratic procedure in getting approval and also creates adversarial relationships among the parties concerned.
. In this case the TBPS was used and the client was satisfied because he is used to the system and he did not have an alternative on which to compare the results.
. He thinks that other Building Procurement System are more flexible than the TBPS.
. He recommends that since other countries are adopting alternative Building Procurement Systems Tanzania should learn and eventually adopt them also.

Appraisal: In this case the Architect did not advise the client on the Building Procurement System to use and he did not ask that the procedure to be used should be the TBPS. However, the Architect admitted that the TBPS is being used less often now than in the past because of the time taken before the actual implementation on site and the adversarial relationship created by the system. The satisfaction of the client was based on the fact that the client did not have any alternative Building Procurement System to compare with the TBPS in terms of time, cost and quality deliveries.

Case study B: This project was co-financed by two parastatal organisations and it consisted a massive rehabilitation of the entire complex of 12 storeys costing about Tshs 5,000,000,000 (approximately USD 6,250,000) at 1999 prices.

The project was subdivided into 11 (eleven) packages with no main contractor in place. All work packages were supervised by a construction manager under the project manager's office. According to the client's representative, the project was carried out using a Project Management System but the Project Manager representative indicated that the system being used was Construction Management. An Architect was involved and when a questionnaire was passed to him, he indicated that the system used was indeed Construction Management.

From the questionnaire to the client's representative the following were extracted:

- He had used the TBPS in the past.
- The system used in this case is different from the TBPS.
- The reason for the change is the nature of the project which needed different specialists contractors and had to be sub-divided into eleven (11) packages.
- The lead consultant was the Project Manager and not an architect.
- When comparing the system used in this case with the TBPS he realised a saving in cost as they did away with profit and attendance payable to the main Contractor when specialist subcontractors are involved.
- He normally decides which Building Procurement System to be used - upon advice by consultants.
- Comparing the results of new BPS with the TBPS the client observed that current BPS produced better results because the responsibilities were narrowed down and assigned to a single entity, that is, the construction manager.
- He decided to use other BPS than the TBPS because being a renovation project with tenants in place; cost, time and quality was important while causing minimum disturbances to the tenants.

The questionnaire sheet meant for consultants in this case was forwarded to the Project Manager and the Architect respectively. The Project Manager responded as follows:-10

He is aware of the following Building Procurement Systems

- Traditional Building Procurement System
- Design and Build
- Package Deal
- Construction Management.

. He learnt about the above system as part of the job practice.

. In this case Construction Management System was adopted

. In this case he advised the client with respect to the type of Building Procurement System to be used

. He recommended Construction Management system due to the need of funding assistance to the original owner of the building

. He prefers to use Construction Management as it gives a chance to any knowledgeable and competent professional (not necessarily an architect) to manage the project.

. He is of the opinion that TBPS has fallen away from favour due to the Architect's, who have been traditionally team leaders, failure to cope with new marketing strategies and technological changes

. He has so far used the following systems in Tanzania

- Traditional Building Procurement System.
- Construction Management.

. In this case the client was satisfied because he was involved in almost all stages of implementation

. He is of the opinion that new Building Procurement Systems attract the involvement of the client that can not be found in the TBPS.

. He recommends that both the client and building related professionals need to be educated on the merits and demerits of other BPS than the TBPS.

Responses from the Architect for the same project was as follows:-

. He is aware of the following Building Procurement Systems all of which he has been able to put into use in Tanzania.
    - Traditional Building Procurement Systems
    - Construction Management
    - Fast track
    - Turnkey
. He learnt them in school and through job experience.
. In this case Construction Management was used
. He did not advise the clients to which system should be used
. He prefers to use the TBPS because it makes the architect responsible for audit-checking of other consultants' work.
. Directions from the client normally influence the use of one system rather than any other
. He observed that the TBPS is not falling away from favour but other systems such as Project Management are not undertaken in their true sense and they revolve around the TBPS.
. In this case the client was satisfied because the Project Manager managed to contain the cost of construction within the agreed budget and it was completed within the given period.
. In the new Building Procurement Systems the Architect cannot control the quality of his design.
. He recommended that before venturing into new Building Procurement Systems there is a need to strengthen the TBPS base.

Appraisal: In this case it is indicated by the Project Manager and the Architect that the Construction Management system was used. The client was of the opinion that the Project Management System was used. The client decided to use this system on the advice by the Consultant (other than the Architect) and he was satisfied with the results at the completion of the project.

He mentioned savings in cost, single point of responsibility and convenience to tenants (renovations were carried out in the presence of the tenants) to be the major parameters behind his satisfaction.

There was a conflicting opinion between the Project Manager and the Architect concerning the use of Construction Management System in this case. Whereas the Project Manager preferred Construction Management system on the basis that it gives opportunities to knowledgeable and competent professionals to manage the project; the Architect preferred the Traditional Building Procurement System on the grounds that it gives responsibility to the Architect to control the quality of his design.

Furthermore, the Project Manager and the Architect differed in opinion about the frequency of use of the TBPS these days when compared with the past. The Project Manager agreed that the TBPS is falling from favour due to the inability of the Architects who have been traditionally team leader to cope with new technological changes and marketing strategies. The Architect in his opinion expressed that the TBPS is not less used because other systems are not undertaken in their true sense and are either the hybrids of the TBPS or are revolving around the same.

However, there was a consensus between the two camps concerning the satisfaction by the client in this case by using a Construction Management system. The Project Manager indicated that the client was satisfied because he was involved in almost all stages of project implementation. The Architect was of the opinion that the Client was satisfied because the consultancy team managed to contain the cost of construction within a given period.

Case study C: The project is an upper market office block for a parastatal organisation completed on 1st September, 1999. The site is a piece of land within the Dar es Salaam Central Business District. According to the client, the TBPS was used although he indicated that there was a slight departure from the TBPS as the contract period was fixed and was not left open for contractors to quote.

The completion cost was approximately Tshs. 20,000,000,000 (approximately USD 25,000,000) at 1999 prices and a 156 weeks completion period was fixed.

From the questionnaire to the client's representative the following were noted:

- The system used was not different from the TBPS although it was indicated that completion time was of essence.
- He observed that the TBPS created competition as compared to other systems and hence could reduce the cost but cautiously noted that it might not necessarily improve quality and overall project implementation time.
- He normally decides which BPS to use based on his consultant's advise.
- He commented that the TBPS produced better results because the Tanzania building industry has grown with it, while the other new systems are bound to create problems due to their not being tested by all parties involved.
- He recommended that the introduction of new systems other than the TBPS be done gradually and carefully and to take time to learn from the experience in other countries where these systems are being applied.

The questionnaire sheet for Consultants was sent to the Architect on 10th September, 1999. It was not until 19th October, 1999 that the Architect finally agreed to discuss the contents of the questionnaire with the Candidate. It was the revealed that he had gone through the questionnaire but refused to fill it in. However the official statement given was that the project was very big and it could not be summarized in three pages of the questionnaire sheet forwarded to him. Even after a thorough discussion on what the candidate needed from of the whole project, the Architect did not show any kind of understanding of the Building Procurement Systems. He repeated similar words, that this project contained wet as well as dry construction, had been managed by experienced consultants and the procurement system used is the one recommended by RIBA and the Architectural Association of Tanzania. When he was asked to explain the Building Procurement Systems recommended by RIBA and AAT he did not mention any one of the systems.

At the end of the discussion the Architect did not clearly indicate which Building Procurement System was used on this project. Furthermore it could hardly be established whether the Architect had ever used alternative Building Procurement Systems.

Appraisal: The client's representative indicated that time was of the essence in this project and completion time had to be set in the tender document. Nonetheless, the client's representative was aware that using the TBPS could reduce the cost due to competition but not necessarily quality and overall project implementation time. This contradiction needed particular attention during the design as well as the construction stage.

Furthermore, the client's representative indicated that he decided on the Building Procurement System to be used based on the advice of his consultants. However, in this case the Architect seemed to be ignorant of the Building Procurement Systems. There is a big question mark left in this case as to how the TBPS came to be used.

Case study D: The project is a world class banking facility for the private financial institution completed in August, 1998. The site is located within Arusha Central Business District. According to the client's representative and the Architect the TBPS was used. The completion cost was approximately Tshs. 400,000,000 (about USD 500,000) at 1999 prices and the project took 12 weeks to be completed.

From the questionnaire to the client's representative the following were noted:

- He had used the TBPS in the past.
- The system used in this case was not different from the TBPS.
- He did not have any other Building Procurement System to compare with the TBPS because he is still using the same.
- He normally decides which BPS should be used upon the advise by his consultant.
- He uses TBPS because it is widely used in the country and it has been tested by time.
- He suggested that alternative Building Procurement Systems may exist in Tanzania but some educational strategies need to be adopted to influence their applicability.

The questionnaire meant for consultants was forwarded to the Architect who is based in a neighbouring country, Kenya, but has a branch office in Dar es Salaam. He responded as follows:-

He is aware of the following Building Procurement Systems.

- Traditional Building Procurement System.
- Design and Build.
- Management oriented procurement systems.

. He first learnt about the above systems in his college studies.

. In this case the Traditional Building Procurement System was used.

. He advised the client as to which system to use.

. Criteria for the recommendation was that the project required a linear progress with deliveries that could easily be managed by traditional consultants.

. He does not prefer particular Building Procurement System because different situations may require consideration of a system which offers the most advantage.

. Complexity of the project and the time within which deliverables are able to accomplish influence his decision to use one Building Procurement System rather the other.

. He is of the opinion that the Traditional Building Procurement System is being used less often these days than in the past because of increased complexity and the need for specialisation and the requirement of the faster delivery of building projects by customers/clients.

. In this case the client was satisfied due to good delivery of the building in good time, with the required quality and at the agreed cost.

. He pointed out that new Building Procurement Systems ensure earlier cooperation and practical involvement of the Contractor in the design process and early commencement on site.

. He recommends that alternative Building Procurement Systems in Tanzania in future should be encouraged to cope with the complexity of building projects and because fast delivery of building is more important to clients nowadays than ever before.

Appraisal: The client normally decides which Building Procurement System should be used upon getting the advice from the Consultant and in this case the Architect advised the client to use the TBPS. The client was satisfied with the outcome of the project because of the controlled time, cost and quality deliveries. However, his satisfaction could be due to the fact that he did not have any other system to compare the results with.

The Architect advised the client to use the TBPS because the project needed a linear progress with deliveries that could be managed by traditional consultants. However, the Architect admitted that the TBPS is being used less these days because of increased complexity of building projects, the need for specialisation of building elements and the Clients' desire for fast delivery of building products.

Case Study E: The project is an office block for a private insurance consultant company. The site is located along Goliondoi Road within the Arusha Municipality. According to the Client the Traditional Building Procurement System was not used because he had paid an Architect to organise all trades involved and advice the client who should be paid what.

According to the Consultant the TBPS was used although not in its entirety because the developer wanted a quick award to a commendable contractor. Hence negotiations started while the design was still going on. This could be probably called as an accelerated Traditional Building Procurement System. The cost of the project was Tshs. 853,311,999 (approximately USD 1,100,000) at 1999 prices and a 52 weeks completion period was agreed.

From the questionnaire filled in by the client the following were noted:-

- He has never used the Traditional Building Procurement System in his 18 housing projects carried out so far.
- The system being used now is different from the Traditional Building Procurement System.

. He could not compare the results of the system being used now with the TBPS because he has never used the system.
. He never decides which Building Procurement System to be used .
. His architect decides which Building Procurement System to be used.
. He is totally ignorant about construction and particularly the Building Procurement Systems
. He needs new ideas on how to save money and improve quality of the final product.
. He was not satisfied with the end result because of cost overrun and poor quality of the project

The questionnaire sheet for consultants in this case was sent to the Architect who responded as follows:-

. He is aware of the following Building Procurement System
    - Open tendering
    - Selective tendering
. He learned about the above systems in his School of Architecture and through practice.
. In this case one contractor was called to negotiate with the developer.
. He advised the client to go for negotiation with the contractor because the developer wanted a quick award to a commendable contractor.
. He prefers to use selective tendering because it is less expensive and it enables award of a project to a familiarly good performing contractor.
. He prefers Building Procurement Systems which can shorten tendering time and assure good performance.
. He is of the opinion that the TBPS is being used less these days than in the past because building developers want to be involved as little as possible in the successful completion of building projects.
. In this case the client was satisfied because the selected Contractor who was previously known for good performance finally got the contract and completed the project properly and in time.

. He thinks that there is a need to learn about other Building Procurement Systems because they have performed quite well in other countries.

Appraisal: In this case there exists a confusion as to which exact Building Procurement System was used. According to the client's representative he entrusted the entire project responsibility to his consultant (the architect). The consultant was responsible for generating the design, arranging the services of other consultants and organising construction of a building including all the sub-contractors. The client was only responsible for paying all people involved upon the recommendation of his consultant.

During the interview the consultant expressed that the responsibilities for design and construction (the basic characteristic of the Traditional Building Procurement System) were vested to two different organisations. He was of the opinion that appointment of the Contractor was done a bit earlier, before completion of the design, to allow early commencement of negotiations and to shorten tendering time.

Furthermore, there was a conflicting opinion between the client and his consultant regarding the question of client satisfaction. While the consultant indicated that the client was satisfied because the project was completed in time, the client on the other side clearly stated that he was not satisfied. During the interview the client expressed his dissatisfaction in the areas of cost, time and quality. He stated that during the initial stage of the design he was not made aware as to the specification of such elements as doors and sanitary ware.

He was compelled to change the specification of doors in the course of construction after those of poor quality were fixed and he had to intervene and import sanitary ware of the quality standard he wanted. He also complained about time overrun as a result of which he lost some prospective tenants due to non-completion of the project in time.

Concerning the quality, the client was bitter about the defects which occurred after practical completion. He stated that the extent of the defects were unbearable and the value of making them good could not be met by the retention fund held by the client. Furthermore he indicated that the defects liability period had long expired and nothing had been done to rectify them. At the end of the interview the client's stated that he was desperate for a good solution to his building plans in the future.

Case Study F: The project is a residential complex constituting 57 villas (houses) currently accommodating all American Embassy staff. The client is the private developer of Asian origin and he explained that this investment is one of his many private properties in town. The site is a piece of land along Msimbazi river within the city of Dar es Salaam. According to the Client representative the Traditional Building Procurement System was not used in this case.

The project value when it was completed in 1997 was Tshs. 414,064,000 (approximately USD 500,000) per unit including external works for each villa, that is, access road, hard landscaping, soft landscaping, swimming pool, boundary wall and garden lighting. Further explanation by the client's representative is that no local consultant was involved in this project. The design was done abroad (in the UK), the client imported all the materials required except those which are locally available like cement, sand, aggregates, steel bars and paints. The client employed a Chinese contractor who was being supervised by one of the family members who happened to have a knowledge of construction.

An extract of the information, from the questionnaire to the client's representative is as follows:-

- He has never used the Traditional Building Procurement System in his building construction projects.
- The system being used now is different from the TBPS
- He opted for other systems because of the need to control time and cost

. He does not use local architects because the family wanted a good design from abroad.
. The family normally decides which Building Procurement System to use.
. Criteria for the selection of Building Procurement System is cost, quality and the ease with which cash flow can be disbursed to the project
. He can not compare the results of the current Building Procurement System with the TBPS because he has never used the TBPS
. He can not comment on the use of alternative BPS in Tanzania in future because he does not have enough experience with any particular system.
. He would like to learn more about BPS to improve his knowledge for future implementation by family projects.

Case study G: The project was foreignly in funded by the Swedish government and consists of the expansion of Ministry of Finance offices. The project was subdivided into two phases with phase I completed in May, 1999 and phase II scheduled for completion by mid year 2000. The project cost for both phases is budgeted at Tshs. 3,200,000,000 (approximately USD 4,000,000) at 1999 prices.

According to the client's representative, an Architect and a Project Manager were involved in this project. The client representative indicated that the Building Procurement System used is slightly different from the Traditional Building Procurement System due to the fact that the project manager was involved. The architect indicated that the Traditional Building Procurement System was used. The Project Manager was of the opinion that the system used was a combination of project management and the Traditional Building Procurement System.

From the questionnaire to the client's representative the following were extracted:-
. He had used the TBPS in the past
. The system used in this case was slightly different from the Traditional Building Procurement Systems
. The reasons for the departure from the pure TBPS was due to the wishes of the donor to introduce the project manager as his representative.

. The lead consultant was the project manager who was employed to oversee performance of other consultants and the contractor and, at the same time, to safeguard
the interest of the donor.
. He is of the opinion that involvement of the project manager necessitated additional expenditure for doing nothing.
. He normally decides which Building Procurement System should be used, upon the advice of the consultants.
. He is of the opinion that the involvement of the project manager did not indicate any improved results from the TBPS.
. He is of the opinion that other alternative Building Procurement Systems may be used in specialised cases where there is a limited number of contractors and designers, in such fields as nuclear reactor plants.

The questionnaire meant for consultants in this case was forwarded to both the Project Manager and the Architect respectively. The Architect responded as follows:-

. He is aware of the following Building Procurement Systems
    - Traditional Building Procurement System
    - "Promotional" Building Procurement System
. He learnt about the TBPS through studies and the other system through practical experience which reflects market needs
. In this case the TBPS was used
. In this case he did not advise the client with respect to the type of Building Procurement System to use.
. He prefers to use the " promotional" system because the consultants can conform not only client's requirements but also to the performance in the delivery of services
. Fast delivery, fighting inflation and quick recovery of capital investment influences him to use one system rather than any other.
. He is of the opinion that the TBPS is falling from favour because it is too cumbersome, takes a long time before the project is implemented on site and it lacks clarity of responsibility.

. In his practice he has mostly used the TBPS
. In this case the client was satisfied because the project was completed on time and the quality level attained was satisfactory
. He was of the opinion that new BPS call for diligence and consciousness of the consultants and the client consultant relationship improves as well as the performance of the building industry.
. His comments are that the TBPS is outdated when put on the world scale as the new world economic order requires efficiency not only on consumer goods but extends to services offered in other fields, the building industry being one of them.

The response from the Project Manager was as follows:-

. He is aware of the following Building Procurement Systems
    - Traditional Building Procurement System
    - Design and Build
    - Turnkey
    - Project Management
    - Construction Management
. He learnt the TBPS at the University and other systems through on-job training
. In this case a combination of project management and the TBPS was used
. He advised the client with respect to the type of Building Procurement System to be used
. He recommended a slight departure from the TBPS to enhance fast construction process and control of quality and price.
. He prefers to use project management system because the system calls for single points of responsibility, good control over design process and is less difficult in imposing varied requirements
. Requirement of the employer's geographical limitation of tenders, nature and magnitude of the work are the factors which influences him to use one system over the other.

. He is of the opinion that development of the building industry, increased specialisation, the need for the manager rather than the designer to co-ordinate building activities are the reasons for the TBPS being used less.
. He has so far used the following systems in Tanzania
    - Traditional Building Procurement System
    - Design and Build
    - Turnkey
    - Project Management
. In this case the client was satisfied because time schedule and other requirements were achieved.
. The new BPS simplifies supervision and creates a good working environment for all parties involved.
. He recommends that there is a need to develop contract documents to easily accommodate alternative Building Procurement Systems.

Appraisal: In this case the client needed funding assistance from another government and the donor country involved their representative bearing the title of the project manager to safeguard her interest. It seems the client was not happy with the involvement of the project because they had to pay his fees. He further, indicated that the involvement of the project manager did not improve the delivery results as far as the cost, time and quality was concerned.

Case Study H: The project is located in the outskirt of Arusha Municipal and constitutes construction of 65 upper market residential units with a commercial centre around the residential complex.

The project was completed in August, 1999 costing about Tshs. 8,500,000,000 (approximately USD 10,000,000) at 1999 prices.The project was subdivided into 4 (four) packages and all were supervised by a construction manager. The client was a parastatal organisation and according to the representative the project was carried out using the Construction Management System.

From the questionnaire to the client's representative the following information was extracted:

. He had used the TBPS in the past
. The system used in this case is different from the TBPS
. The reasons for the change was time constraints and tight budget control
. The lead consultant was the Construction Manager and not an architect
. When comparing the system used in this case with the TBPS he realised the benefits of controlled cost and improved time management
. He normally decides which Building Procurement Systems to be used based on the parameters dictated in the project feasibility study
. Comparing the results of the new BPS with the TBPS the client observed that current BPS produced better results because it allowed flexibility as a means of reducing costs and it enhance quality.

Response from the Consultant to the questionnaire forwarded to him was as follows:-

. He is aware of the following Building Procurement Systems
    - Traditional Building Procurement System
    - Design and Build
    - Construction Management
. He learnt about the above systems through formal training for the TBPS and in books, journals and through practice.
. In this case the Construction Management system was used but he did not advise the client's as to which system should be used.
. He preferred to use the TBPS because it defined the responsibility between design and construction
. The TBPS is being used less often these days than in the past because the system takes a long time to complete especially when the client lacks qualified manpower in the related field to construction
. In this case the client was satisfied because the project was completed on schedule and within the budget.
. He thinks that other BPS are more flexible and thus take less time for project implementation than the TBPS

. He recommends that with the liberation of the building industry, Design and Build has a bright future but people need to be educated about it.

Appraisal: In this case the Consultant did not advise the client on the Building Procurement System to use and he did not ask the procedure used to adopt the Construction Management system. Nonetheless, the Consultant admitted that the TBPS is being used less often now because of the overall time taken to implement the project from inception through to completion. Satisfaction of the client was based on the fact that the cost was properly controlled and that the quality level achieved was satisfactory.

Case Study I: The project was foreign funded by the Norwegian government and consists of the construction of two lecture theatres for one of the Universities in Tanzania. The project is located on a piece of land in the University campus on the outskirts of the city of Dar es Salaam. The project was completed in November, 1999 at the total project cost of Tshs. 3,500,000,000 (approximately USD 4,375,000) at 1999 prices.

According to the client's representative an Architect and a Project Manager were involved in this scheme. The client representative was of the opinion that the TBPS was not used per se because the project manager was involved. The Architect indicated that the TBPS was used with the project manager in place. The Project Manager was of the opinion that Construction Management System was used rather than the TBPS

From the questionnaire to the client representative the following information was obtained:-

. He had used the TBPS in the past.
. The system used in this case was different from other TBPS due to the fact that the project manager was involved.
. The reason for adopting a system other than TBPS was due to the wishes of the financing country having her representative
. The lead consultant was the project manager who acted as the representative of the financing country.

. He is of the opinion that involvement of the project manager improved the spirit of teamwork.
. He normally decides the BPS to use but in this case the donor country had its hand in the decision making.
. He is of the opinion that the involvement of the project manager called for improved results in term of completion time and cost control.
. He is of the opinion that other alternative BPS may be used but appropriate information needs to be disseminated among all parties.

The questionnaire meant for consultants in this case was forwarded to both the Project Manager and the Architect respectively. The Architect responded as follows:-

. He is aware of the following Building Procurement Systems
    - Traditional Building Procurement System
    - Turnkey
    - Build Operate and Transfer.
. He learnt about the TBPS through studies and other systems through experience
. In this case TBPS was not used per se due to the presence of the project manager
. He did not advise the client on the type of Building Procurement System to use
. He does not have a preferred Building Procurement System because mainly the TBPS is in use.
. He is of the opinion that the nature, type or size of the project as well as the client or donor's wishes coupled with the legal framework dictate the use of one BPS rather than another.
. He is of the opinion that the TBPS is falling from favour because the building industry is becoming more commercialised and clients are being more business oriented now than in the past.
. In his practice he has mostly used the TBPS and other Systems involving the project manager.

. In this case the client was satisfied because of good teamwork by the consultants.
. He recommends that the new Building Procurement System should be implemented with care because in the country there is no adequate skills and expertise to support their appropriate use.
. The response from the Project Manager was as follows:-
. He is aware of the following Building Procurement Systems
    - Traditional Building Procurement System
    - Project Management
    - Turnkey
. He learnt all the above Building Procurement System through practice
. In this case the Construction Management system was used.
. He did not advise the type of Building Procurement System to be used in this case.
. He prefers to use Project Management because it gives the client an opportunity to appoint the right project leader.
. He prefers to use Project Management system because it allows new ideas to come in during project implementation.
. In this case the client was satisfied because he (client) had the opportunity to be fully involved in all major decision for the project before they were implemented.
. He is of the opinion that the new Building Procurement Systems give the client an opportunity the right team leader for the right project.
. He is of the opinion that clients are more knowledgeable now than ever before due to changes from a closed to free market economy and hence callings for appropriate Building Procurement System. He also observed that more competent contractors could now be found in the industry to adopt new Building Procurement Systems.

Appraisal: In this case the client obtained financial assistance for a donor country to construct two lecture theatres. The donor country introduced the Project Manager to the project team to monitor the work progress and the expenditure of disbursed funds. The client in this case was happy with the results of the project because the project manager cultivated the teamwork and time, cost and quality were properly controlled.

Case Study J: The project is an office block located within the city of Dar es Salaam. The standard of finishings was for middle class tenants and the total project cost was about Tshs. 1,200,000 (approximately USD 1,500,000) when it was completed way back in 1995.

The client is the private developer and he explained that no consultant was involved. He directly employed trade contractors to construct his building after obtaining architectural drawings from one of his relatives.

Information extracted from the client's questionnaire is as follows:-

- He did not use the Traditional Building Procurement System for this and other projects
- He opted for other systems in order to have a proper control of cost and quality
- He normally decides which Building Procurement System to use by consulting trade contractors.
- He could not compare the results of the current Building Procurement System with the TBPS because he has never used the TBPS

5.3 CLIENTS' SURVEY

The intention of this survey was to test the appropriateness of the Building Procurement System used for each studied cases. A structured interview was carried to all ten case studies between the author and representatives of clients. The respondents were orally interviewed and guided through the selection of systems outlined in appendix IV. This BPS selection method was preferred due to its simplicity and the way it relates the characteristics of the most commonly used procurement systems to a list of client's priorities or needs for his project. Other advantages of this method of BPS selection over others are detailed in section 4.5 of this research.

The results of each case studies are outlined hereunder and the actual response by client representatives are attached in appendix VII for reference purpose.

Case study A: When the client's representative was interviewed orally using guidelines outlined in appendix IV the results were as follows:-

Priority	Response
. Timing	Crucial
. Controllable variations	Yes
. Complexity	Moderately so
. Quality level	Good but not special
. Price certainty	A target plus or minus will do
. Competition	No other factors more important
. Division of responsibility	Can manage separate firms
. Professional responsibility	Yes
. Risk avoidance	Yes

During the course of the interview it was observed that using the guideline in Appendix IV for identification of client priorities, the appropriate Building Procurement System would have been the Accelerated Traditional Building Procurement System although Sequential Traditional Building Procurement System was used.

Case study B: When the client's representative was interviewed orally using the guidelines outlined in Appendix IV, the results were as follows:-

Priority	Response
. Timing	Crucial
. Controllable variation	Definitely not
. Complexity	Moderately so.
. Quality level	Good but not so special
. Price certainty	Yes
. Competition	Certainly for all construction work
. Division of responsibility	Must have only one firm for everything
. Professional responsibility	Yes
. Risk avoidance	Prepared to share agreed risk

During the interview with the client's representative using a guideline in Appendix IV observed that this project needed more input of management style. The most appropriate Building Procurement System was therefore Management Contracting and not Construction Management as was the case.

Case study C: When the Client's representative was interviewed orally the following results were noted:

Priority	Response
. Timing	Crucial
. Controllable variations	Yes
. Complexity	Yes
. Quality level	Prestige
. Price certainty	Yes
. Competition	Certainly for all construction work
. Division of responsibility	Must have only one form for everything
. Professional responsibility	Yes
. Risk avoidance	Yes

During the interview with the client's representative using a guideline in Appendix IV, it was observed that the project should have been carried out using management contracting system or contractor project manager's system.

Case study D: From the interview with the client's representative using guidelines as per appendix IV the results were as follows:-

Priority	Response
. Timing	Crucial
. Controllable variations	Definitely not
. Complexity	Moderately so
. Quality level	Prestige
. Price certainty	Yes
. Competition	Construction and management teams

. Division of responsibility	Can manage separate firms
. Professional responsibility	Yes
. Risk avoidance	Prepared to share agreed risks.

During the interview it was observed that using a guideline in Appendix IV for identification of client priorities the appropriate Building Procurement System was the Management Contracting, although the TBPS was used.

Case study E: When the client's representative was interviewed using guidelines outlined in appendix IV, the results were as follows:-

Priority	Response
. Timing	Crucial
. Controllable variations	Definitely not
. Complexity	Moderately so
. Quality level	Good but not special
. Price Certainty	A target plus or minus will do
. Competition	No, other factors more important
. Division of responsibility	Must have only one form for everything
. Professional responsibility	Not important
. Risk avoidance	Yes

This project needed amalgamation of design and construction responsibilities. The most appropriate Building Procurement System was direct Design and Build.

Case study F: When the client's representative was interviewed using guidelines outlined in appendix IV the results were as follows:-

Priority	Response
. Timing	Important
. Controllable variations	Yes
. Complexity	Moderately so
. Quality level	Prestige
. Price certainty	A target plus or minus will do

. Competition	Certainly for all construction work
. Division of responsibility	Can manage separate firms
. Professional responsibility	Yes
. Risk avoidance	Prepared to share agreed risks

From the client's priorities listed above, this project has three options that is, accelerated TBPS, Management Contracting and Construction Management. Something obvious from the above score is that the project needed more emphasis on managerial input.

Case study G: When the clients' representative was interviewed orally for the priority rankings the response was as follows:-

Priority	Response
. Timing	Crucial
. Controllable variations	Yes
. Complexity	Yes
. Quality level	Prestige.
. Price certainty	A target plus or minus will do
. Competition	Construction and management team
. Division of responsibility	Can manage separate firms
. Professional responsibility	Yes
. Risk avoidance	Prepared to share agreed risks

From the client's list of priorities the projects would have been either undertaken by using Accelerated Traditional Building Procurement System or Management Contracting system.

Case study H: When the client's Representative was interviewed orally using guidelines outlined in appendix IV the results were as follows:-

Priority	Response
. Timing	Crucial
. Controllable variations	Definitely not

. Complexity	Moderately so
. Quality level	Prestige
. Price certainty	Yes
. Competition	Certainly for all construction work
. Division of responsibility	Must have only one form for everything
. Professional responsibility	Yes
. Risk avoidance	Prepared to share agreed risk.

During the course of the interview it was observed that using the selection matrix in appendix IV for the identification of client priorities the appropriate Building Procurement System was the Management Contracting although the Construction Management System was used.

Case study I: When the client representative was interviewed orally for identifying his priorities, the response was as follows:-

Priority	Response
. Timing	Important
. Controllable variations	Yes
. Complexity	Moderately so
. Quality level	Good but not special
. Price certainty	Yes
. Competition	Construction and management team
. Division of responsibility	Can manage separate firms
. Professional responsibility	Yes
. Risk avoidance	Prepared to share agreed risk

From the client's list of priorities the appropriate Building Procurement System was Management Contracting.

Case study J: When the client's representative was interviewed using guideline outlined in appendix (IV) the results were as follows:-

Priority	Response
. Timing	Important
. Controllable variations	Yes
. Complexity	Moderately so
. Quality level	Good but not special
. Price certainty	A target plus or minus will do
. Competition	Certainly for all construction work
. Division of responsibility	Can manage separate firm
. Professional responsibility	Yes
. Risk avoidance	Yes

From the client's priorities listed above, this project was suitable to be undertaken by Construction Management system

Table 5: Application of BPS as observed through case studies.

Case	BPS Used	Appro-priate	Inappro-priate	Ideal BPS as per matrix	Experience with new BPS	Formal Training in New BPS
A	TBPS	*		Accelerated TBPS	Limited	No
B	CM		*	MC	Limited	No
C	TBPS		*	MC	No	No
D	TBPS		*	MC	Yes	Yes
E	DM		*	DM	No	No
F	DC		*	CM	No	No
G	CM		*	TBPS/MC	Limited	No
H	CM		*	MC	Limited	No
I	TBPS		*	MC	Limited	No
J	DM		*	CM	No	No

The response by clients and their representatives is summarised on table 5.1 above.

5.4 CONSULTANTS' SURVEY.

The decision was made that a second survey was necessary to improve the sample size. Main focus for the second survey was on changes in use of Building Procurement System, consultants knowledge of different BPS and how this knowledge was acquired. In this survey a questionnaire was sent to 15 different architectural firm including five covered in the case studies. Fourteen firms responded including four leading consultant firms in the country. A statement was included at the beginning of the questionnaire guaranteeing the respondents of their anonymity.

Results from the survey study showed that TBPS dominated in the past being used on to 91 per cent of the overall building projects in Tanzania. Other forms of Building Procurement Systems occupied the following percentages:-

Table 6: Use of BPS in the past.

Building Procurement Systems	**Score (%)**
Traditional Building Procurement System	91.0
Design and Build	3.6
Management Contracting	0.1
Construction Management	1.7
Turnkey / Package Deal	0.4
Design and Manage	3.2
Develop and Construct	0
Build – Own – Operate – Transfer	0
TOTAL	**100**

Further to the above the survey clearly indicated that there was a trend towards change in the use of Building Procurement Systems. The percentage covered by the TBPS in the future was predicted to decline to 38 per cent of the overall building projects to be executed in Tanzania. Other forms of Building Procurement Systems were likely to increase their market share as follows:-

Table 7: Expected use of BPS in future.

Building Procurement Systems	Score (%)
Traditional Building Procurement System	38.0
Design and Build	16.0
Management Contracting	6.4
Construction Management	7.5
Turnkey / Package Deal	11.1
Design and Manage	4.2
Develop and Construct	3.2
Build – Own – Operate Transfer	13.6
TOTAL	**100**

To supplement the findings of the consultants' knowledge of the certain new Building Procurement System out of fourteen architects covered under the consultants survey of the knowledge acquired the results were as follows:-

Table 8: Consultants' knowledge on BPS.

Knowledge Acquired	Architects
Through experience	4
By reading text books	2
Through formal training	2
By recruiting on expert	0
Other means (interaction with others)	5
TOTAL	**13**

5.5 SUMMARY

It would seem that in Tanzania most of the clients are unable to identity advantages of alternative systems over the TBPS. This is because during the survey it was discovered that while the clients who used the TBPS are satisfied with the results, they do not have other bench marks on which to compare their satisfaction . Also it was found that some of the consultants are indeed aware of the alternative BPS, however, they do not advise their clients on the selection of appropriate BPS because:

- they are lacking in a guiding tool to enable proper selection
- they are not sure of the outcome of new BPS because they have not been time tested
- the fear of loosing their repeated clients due to the satisfaction they have already shown by using the TBPS

In general, the selection of BPS to most projects was found inappropriate. Research has revealed that the way in which many clients, and their professional advisors select the method of procurement is in most cases arbitrary and haphazard, ill - treated and lacking in logic.

In Tanzania confusion still exists about the consideration of project management being one of the procurement systems. The literature review has revealed that project management is excluded because the project manager could be applied to any procurement system.

Another point of interest which was recorded during the survey is that, previously, an architect acted in the capacity of project manager and a project leader. With the complexity of modern day projects, architects are under a lot of strain to design, co-ordinate and supervise the construction. The work of the Project Manager for the cases surveyed is to help manage a project during construction.

Project Managers ensure that the budgets do not overrun and programmes are maintained, and the quality of development is not compromised. Unfortunately there are cases where Project Managers proved to be more obstructive than helpful. This could be attributed to the fact that their role in the industry is relatively new and they are trying to establish and justify their positions in the building industry hierarchy.

The results of this case studies are further analysed in the next chapter.

6.1 INTRODUCTION

The results of surveys and case studies concerning the current Building Procurement Systems (BPS) selection practice in the Tanzania building industry was provided in chapter five. In this chapter, these results are consolidated and analysed further. A survey was made to support case studies based on the questionnaire attached in appendix III. This survey was carried to owners or managing directors of fourteen out of 33 registered architectural registered firms. It is believed that the outcome of this pilot survey fairly represents the entire building industry of Tanzania.

On the other hand an attempt is made to interpret the outcomes and therefore generate new propositions for testing the hypothesis. Thus the purpose of the research is fulfilled in the hypothesis will be proven or rejected and new propositions generated to assist in formulating a base for future researches.

6.2 TESTING HYPOTHESIS I

The first hypothesis was that "*The Tanzania Building Procurement Systems has fallen from favour because of its frequent failure to deliver in terms of time, cost and quality*".

The respondents to the questions intended to address this hypothesis in the case study projects were asked to agree or to disagree on the fact that the TBPS has fallen from favour. Those who agreed, were further asked to give their reasons as to why the TBPS has fallen. In response to the first question "has the TBPS fallen from favour", the following were noted:-

Table 9: TBPS has fallen from favour.

Case Study	YES	NO	No Response
A	*		
B		*	
C			*
D	*		
E			*
F	*		
G	*		
H	*		
I	*		
J			*
TOTAL	**6**	**1**	**3**

Out of ten case studies, six respondents that is 60 per cent, agreed that the TBPS had fallen from favour, one respondent representing 10 per cent disagreed and three did not respond to this question as they have no any basis for this answer. This creates a general feeling that the TBPS has fallen from favour. However, when asked to give reasons for the failure of the TBPS only three case studies directly mentioned the factor of time to be the one of causes. Other reasons put forward were as follows:-

. Creating adversarial relationship among parties.
. Failure of the architects to cope with new marketing strategies and technological changes.
. Increased complexity of buildings and the need for specialisation.
. Desire by building developers to delegate responsibilities and be less involved
. Need for single point of responsibility.

From the consultants survey several reasons were put forward to be the causes of change from the TBPS to other systems. Response to this is referred in table 5.2 and 5.3. These include:-

. Foreign investors influences.
. Globalisation of trade and buildings being traded as other products.
. Expansion of private sector to utilise the building as a commercial product.
. Clients are in need of fast delivery systems.
. Expansion of electronic information technology.

Therefore the first hypothesis has been proved in part, that in Tanzania the TBPS has not "fallen" but is in the process of falling from favour. The second part of hypothesis which calls for reasons of its failure to include time, cost and quality seem not to be the entire cause. Apart from time there are other causes creating a demise of the TBPS. In fact it would appear to be clients who are the driving force in the process of change.

6.3 TESTING HYPOTHESIS II

The second hypothesis was that " *The new Building Procurement Systems are inappropriately applied on projects due to the consultants' inexperience with certain new systems".*

This hypothesis is divided into two parts, that is, in cases when other BPS than the TBPS have been used have been incorrectly applied, for instance, where the Design and Build was used, the appropriate system would have been Management Contracting. Secondly is that the inappropriate application of the new BPS is due to the consultants' inexperience with those new systems. From the case study data presented in table 5.1, it can be seen that of the 10 projects concerned only one had used the appropriate BPS.

However, the use of appropriate BPS on that project happened by chance and not be design. This is based on the fact that the consultant had limited knowledge of the new BPS (mainly the TBPS and DB), and he did not advise the client which system should be used. The client himself decided which BPS to be used and he did not have any knowledge about others. In all other cases alternative procurement system would have provided "better fit".

From these, results it can be seen that there are more than one item to be looked into viz.

- Out of six case studies where the new BPS were used none of them was appropriately applied.
- Out of four case studies where the TBPS was used only in one case proved that the system was appropriately applied.
- Out of eight consultants involved in the case studies only one consultant seemed to have undergone thorough formal training of BPS. The rest had either limited knowledge of the new BPS, acquired through on job training or did not have the knowledge at all.

Further survey carried to consultants (ref table 5.4) out of 13 architects, only two of them indicated that they gained BPS knowledge through formal training.

Therefore this hypothesis has been positively proved that the new BPS is inappropriately applied and this is due substantially to the inexperience of the consultants.

6.4 TESTING HYPOTHESIS III

This hypothesis attempts to assess if "*client are satisfied with the results of the new Building Procurement Systems (BPS)*".

To make a fair assessment even clients who used the TBPS were asked to state their level of satisfaction with the results of that system. The following are the outcome:

Table 10: Client satisfaction

Case Study	BPS used	Satisfaction
A	TBPS	YES
B	CM	YES
C	TBPS	YES
D	TBPS	YES
E	DM	NO
F	DC	YES
G	CM	NO
H	CM	YES
I	TBPS	YES
J	DC	YES

It seems that in all the cases where the TBPS was used, the clients were satisfied with the end product. However, reasons given by clients regarding their satisfaction are similar to that encountered during the literature review such as:-

- no alternative BPS to compare
- the industry has grown with it
- it has been tested by time.

On the other hand, in those cases where new or alternative BPS other than the TBPS were used half of the clients were satisfied with the results and half of them were not. Those satisfied mentioned a narrowed single point of responsibility, controlled quality, cost and cash flow planning to be some aspect behind their satisfaction. Those who were not satisfied mentioned the increased cost of employing a project manager, poor product quality, time and cost overruns. The later cases could have been attributed to the Consultant's inexperience with certain new BPS as was the case in for case study E.

Therefore this hypothesis has not been positively proved because 100% of clients who used the TBPS are satisfied with the results, 67% of clients who used alternative BPS were satisfied and 33% were not. This may call for a further study in this area as to why 33% were not satisfied.

6.5 SUMMARY

The important findings from this survey can be summarised as follows:

- The TBPS has fallen from favour because of its failure to deliver in terms of time, good working relationship among parties, the need for clients to be minimally involved and their desire for a single point of responsibility.
- The new BPS is inappropriately applied on projects due to the Consultant's inexperience with certain new BPS and their lacking of a guiding tool to enable proper selection
- Clients who used the TBPS were all satisfied with the results of the system simply because they had no comparison. Those who used alternative BPS were not fully satisfied due to the failure to deliver in terms of time, cost and quality.

CHAPTER SEVEN

FINDINGS, CONCLUSION AND RECOMMENDATIONS

7.1 INTRODUCTION

This chapter draws the conclusion right from the problem statement formulated in chapter one, literature review covered in chapter two, three and four and the data collection and analysis in chapter five and six. The summary of findings is also highlighted in this chapter. This chapter also makes recommendation on ways to improve the performance of the building industry through the adoption of alternative Building Procurement Systems.

7.2 SUMMARY OF FINDINGS

Satisfaction of construction industry clients has been found to be reflected to the level at which delivery time, construction cost and product quality requirements are being met. Any attempt to improve the construction industry performance can not ignore the fact that time, cost and quality standards are the client's needs which have to be considered.

However, there exist a strong link between these client's needs and Building Procurement Systems. This linkage emanate from the fact that Building Procurement System defines the organisational framework of the entire construction team. It is through this framework that duties and responsibilities of each member of the team are established in order to meet the client's needs.

Building Procurement Systems change is relatively a new phenomenon with its main cause being a demand by customers. A cross – section of world review, an overview of developing countries and the Tanzanian context has shown that desire by clients to procure buildings more quickly, cheaply and of quality standard has been the major driving force behind Building Procurement System changes. Consultants and contractors are under pressure to look efficient ways of selling their services and products. Hence they are continuously exploring new Building Procurement System.

The body of knowledge about Building Procurement System is still evolving and developing among researchers, practitioners and building developers. There is not yet an agreed format of categorising Building Procurement System as well as method of selecting the most appropriate system.

However, there exist guidelines that are useful ranging from a computer package software programme to a simple guidance used in this research which reduces all possible alternatives to a manageable number. All guidelines being explored have something in common. They are trying to aggregate client's objectives and project characteristics then identify the potentially appropriate Building Procurement System to meet the two.

Findings, particularly from case studies and other surveys, have shown that in Tanzania the professions are largely not aware of this developing body of knowledge. It seems that it is being forced upon them by clients. Those who have attempted to use alternative Building Procurement System are still experimenting their application and it may be for this factor that is leaving clients uncertain. Surveys have shown that it is important they are educated because it would seem that they default to ones that they understand but because they are not appropriate for the project conditions they are causing dissatisfaction.

7.3 CONCLUSION

This study aimed at assessing the rate at which new Building Procurement Systems other than the Traditional Building Procurement System are being practiced and their appropriate application. There is a clear inclination towards the application of new Building Procurement System and their respective organisation structures. This has been generated from the case studies and other surveys. It proves the first hypothesis to be positive.

However, the appropriateness of the Building Procurement System in relationship to the client's objectives and project characteristics is not consistent. It was found that the majority of the practitioners are aware of the terms used to describe the new Building Procurement Systems but the appropriate meaning of these terms and experience in their application leaves a lot to be desired. In this respect the second hypothesis was fully supported.

The findings from case studies and other surveys gave identical results showing that clients who used the Traditional Building Procurement System were satisfied with the results. On the other hand of a group of clients who used the new Building Procurement Systems were satisfied with the results of the end product. Therefore the new BPS are somehow delivering positive results as it is purported. The aspect of these new Building Procurement Systems facilitating desired time is acceptable but the question of cost and quality levels does not hold. Thus the third hypothesis could not be completely validated.

7.4 RECOMMENDATIONS

In view of the findings, the way most clients and their professional advisors select procurement systems for their projects is inappropriate. The following are recommended to cultivate ideal knowledge, create proper understanding and hence lead to the selection of appropriate Building Procurement System to building projects in future. Some of the data generated by this study has shown that most of the consultants and clients are not familiar with current developments in Building Procurement System. As a means of exposing them to theory and practice:

- Introduce continuous professional development (CPD) programmes to practitioners through seminars, workshops and construction new letters on the subject matter. Much has been done using similar models to update practitioners' knowledge in matters of arbitration, building contracts and other building policies. Statutory bodies such as Architects & Quantity Surveyors Registration Board, Engineers Registration Board and the National Construction Council are best placed to perform this role. Similarly professional bodies such as Tanzania Institute of Quantity Surveyors, Architectural Association of Tanzania, Institute of Engineers in Tanzania and Association of Consulting Engineers in Tanzania can provide a useful training back up in this aspect.

- Introduce Building Procurement System subjects into the Universities as well as technical colleges curricula where the future professional generation is being moulded.

- In order to establish the basic principles of formulation of an appropriate Building Procurement System for various building projects, the National Construction Council should establish appropriate methods of selecting appropriate Building Procurement System.

There are a number of ways in which this can be achieved but as a starting point a literature survey should be carried out throughout the country as an audit of available methods of selecting Building Procurement System. This should be followed by intensive validation and checking to establish selecting methods which are appropriate to the Tanzania building industry.

- The standard forms currently in use are based purely on the practice of the Traditional Building Procurement System thus limiting the use of alternative Building Procurement Systems. It is recommended that work be done in establishing a standard form flexible which could be used for any selected Building Procurement System. For any selected Building Procurement System based on the actual tasks peculiar to the project, the standard form of contract should be adjusted to deal with respective tasks.

- There is a general perception that practicing other Building Procurement Systems than the Traditional Building Procurement System could be illegal. The Government, through its organs should create a legal framework whereby new Building Procurement Systems can be practised without any fear.

7.5 AREAS FOR FURTHER RESEARCH

In the search for literature review for this study it was evident that little, if not none, has been said or written about new Building Procurement Systems and their appropriate use in the Tanzania building industry. It is important therefore, to recommend that much need to be explored as far as Building Procurement Systems are concerned in order to improve the performance of the industry in general. The following may be areas for further research:-

- Identification of clients objectives, project characteristics and their relationship with Building Procurement Systems in the Tanzania context
- The influence of Building Procurement Systems on the success or failure of building projects in Tanzania
- The sufficiency of current standard forms of contract with regard to the new Building Procurement Systems.

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APPENDICES

Appendix I

Research Questionnaire Sheet (to Clients)

APPENDIX I

RESEARCH QUESTIONNAIRE SHEET (TO CLIENTS).

CASE STUDY: .....

.....

Please note that, although this questionnaire is in whole aimed at collecting all available information on building procurement systems in general there are however some particular questions which aim on the case study project referred above.

1. Did you ever use the Traditional Building Procurement System (TBPS) in your building construction project?

   .....
   .....
   .....

2. Is the Building Procurement System you are using now different from the previous (TBPS)?

   .....
   .....
   .....

3. If YES, why did you change from the TBPS?

   (a) Time constraints ☐

   (b) Cost overrum ☐

   (c) Poor quality of end product ☐

   (d) Consultants advice ☐

   (e) Others (please elaborate).....

4. If your lead consultant is not an architect why did you change?

   .....
   .....
   .....

5. Recalling about the old system, did it have improved results with respect to time, cost and quality when compared to new Building Procurement System used now?

   .....
   .....
   .....

6. Do you decide which Building Procurement System should be used in your building construction projects?

Yes	No

7. If YES, what criteria do/did you use?

.....
.....
.....

8. If NO, who decides?

.....
.....
.....

9. If you are able to compare your current Building Procurement System with the Traditional Building Procurement System (thinking of two specific projects), which system produced the best results?

.....
.....
.....

10. What was important to you in making this decision?

.....
.....
.....

11. What comments would you make on the use of alternative Building Procurement Systems in Tanzania in the future

.....
.....
.....

12. Kindly indicate if you would like to be informed of the outcome of this research

Yes	No

If YES, please give out the reason (s).....

13. What other related researches which in your opinion would be useful in the Tanzania Building Industry

Research	More Useful	Equally Useful

14. Optional:
Name and profession.....

Organisation /Company.....

Address.....

Telephone.....

Fax.....

E - mail .....

Thank you for you kind co - operation

A.M. KAMALA

APPENDIX II

RESEARCH QUESTIONNAIRE SHEET (TO CONSULTANTS)

CASE STUDY: .....

.....

Please note that, although this questionnaire is in whole aimed at collecting all available information on building procurement systems in general there are however some particular questions which aim on the case study project referred above.

1. Being one of the participants in the Tanzania building industry which building procurement systems you are aware of ?

   .....
   .....
   .....

2. For the building procurement systems indicated above, how did you first learn about them? You may wish to either account for each individually or collectively.

   .....
   .....
   .....

3. With respect to the project under study which building procurement system was used?

   .....
   .....
   .....

4. With respect to the type of Building Procurement System used in the project covered in 3 above, did you advise the client which one should be used?

Yes	No

5. If YES, what criteria did you use (why did you recommend it)?

   .....
   .....
   .....

6. Do you have a preferred Building Procurement System and why?

   .....
   .....
   .....

7. What influences you to use one rather than another?

   .....
   .....
   .....

8. Why do you think that the Traditional Building Procurement System (TBPS) is being used less these days than in the past?

.....
.....
.....

9. Please mention Building Procurement Systems you have so far used on Tanzanian projects

(a).....
(b).....
(c).....

10. With reference to this project, was the Client satisfied or not?

Yes	No

11. If YES, why?

.....
.....
.....

12. If NO, do you think that the TBPS would have produced better results?

.....
.....
.....

13. What do the new Building Procurement System offer that cannot be found in the Traditional Building Procurement System TBPS?

.....
.....
.....

14. What comments would you make on the use of alternative Building Procurement Systems in Tanzania in the future

.....
.....
.....

15. Kindly indicate if you would like to be informed of the outcome of this research

Yes	No

If YES, please give out the reason (s).....

16. What other related researches which in your opinion would be useful in the Tanzania Building Industry

Research	More Useful	Equally Useful

17. Optional:

Name and profession.....

Organisation / Company .....

Address.....

Telephone.....

Fax.....

E - Mail.....

Thank you for your kind co - operation

A.M. KAMALA

Appendix III

Research Questionnaire Sheet (to Architects)

APPENDIX III

RESEARCH QUESTIONNAIRE SHEET

Please note that the information which will be generated from this questionnaire is meant for academic purpose only. All information will be treated as "confidential" and will not be retrieved in any other form without the prior approval of the respondent.

1. Please indicate the approximate percentage use of the Building Procurement Systems used in your office over the last 10 years

Building Procurement System	Percentage
. Traditional Building Procurement System	.....
. Design and Build	.....
. Management Contracting	.....
. Construction Management	.....
. Package Deal / Turnkey System	.....
. British Property Federation	.....
. Design and Manage	.....
. Develop and Construct	.....
. Build Own Operate and Transfer (BOOT)	.....

2. Do you see trend towards change in the use of Building Procurement Systems

YES	NO

3. If YES, why is there such a trend towards change?

.....
.....
.....

4. If YES, (in 2 above), how would you see those percentages in 10 years to come?

Building Procurement System	Percentage
. Traditional Building Procurement System	.....
. Design and Build	.....
. Management Contracting	.....
. Construction Management	.....
. Package Deal / Turnkey System	.....
. British Property Federation	.....
. Design and Manage	.....
. Develop and Construct	.....
. Build Own Operate and Transfer (BOOT)	.....

5. How did you acquire your knowledge about non traditional Building Procurement Systems?

(a) Through experience ☐

(b) By reading text books ☐

(c) Through formal training ☐

(d) By recruiting an expert ☐

(e) Others means (specify) .....

.....

6. (a) If you selected 5 (a) above please describe the number of years experience with a specific Building Procurement System

.....

.....

.....

.....

6. (b) If you selected 5 (b) above please describe the text books

.....

.....

.....

.....

6.(c) If you selected 5 (c) above please describe course attended and the year in which it was undertaken

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.....

.....

6. (d) If you selected 5 (d) above please describe the arrangement used to recruit an expert

.....

.....

.....

6. (e) If you selected 5 (e) above please explain

.....

.....

.....

7. Do you think that there is a need for formal Building Procurement Systems training to be attended in Tanzania?

.....

.....

.....

Optional:

Name and profession.....

Organisation / Company.....

Address.....

Telephone.....

Fax.....

E- mail.....

Thank you for you kind co - operation

Signature removed
A.M. KAMALA

Appendix IV

Procurement System Selection Matrix

A Timing	How important is early completion to the success of your project?	Crucial
		Important
		Not as important as other factors
B Controllable variation	Do you foresee the need to alter the project in any way once it has begun on site, for example to update machinery layouts?	Yes
		Definitely not
C Complexity	Does your building (as distinct from what goes in it) need to be technically advanced or highly serviced?	Yes
		Moderately so
		No, just simple
D Quality level	What level of quality do you seek in the design and workmanship?	Basic competence
		Good but not special
		Prestige
E Price certainty	Do you need to have a firm price for the project construction before you can commit it to proceed?	Yes
		A target plus or minus will do
F Competition	Do you need to choose your construction team by price competition?	Certainly for all construction work
		Construction and management teams
		No, other factors more important
Gi Responsibility Division of	Can you manage separate consultancies and contractors, or do you want just one firm to be responsible after the briefing stage?	Can manage separate firms
		Must have only one firm for everything
Gii Responsibility Professional	Do you want direct professional responsibility to you from the designers and cost consultants?	Not important
		Yes
H Risk avoidance	Do you want to pay someone to take the risk of cost and time slippage from you?	No, prefer to retain risk and therefore control
		Prepared to share agreed risks
		Yes

	Traditional			Design and build			Management		Design and manage			
	Sequential	Accelerated	Direct	Competitive	Develop and construct	Management contracting	Construction management	Contractor project manager	Consultant project manager		
1		●	●			●	●	●	●	Crucial	A Timing
2		●	●	●	●	●	●	●	●	Important	
3	●									Not crucial	
4	●	●				●	●	●	●	Yes	B Controllable variation
5			●	●	●					No	
6	●	●				●	●	●	●	Yes	C Complexity
7		●	●	●	●	●	●	●		Moderately	
8			●	●						No	
9			●	●						Basic	D Quality level
10	●	●	●	●	●	●	●	●	●	Good	
11	●	●				●	●			Prestige	
12	●		●	●	●	●		●		Yes	E Price certainty
13		●					●		●	Target	
14	●			●	●	●	●	●	●	Construction	F Competition
15	●				●	●				Construction & management	
16		●	●							No	
17	●	●				●	●			Separate firms	Gi Responsibility Division of
18			●	●	●			●	●	One firm only	
19			●	●	●			●		No	Gii Responsibility Professional
20	●	●				●	●		●	Yes	
21							●		●	No	H Risk avoidance
22	●	●				●				Share	
23			●	●	●			●		Yes	
Totals											

Identifying your priorities

Appendix V

List Respondents

APPENDIX V

List of people interviewed during data collection exercise.

	Name	Company / Organisation /Institution
1.	A. Kilima	Parastatal Pensions Fund
2.	A. Marress	Architects & Quantity Surveyors Registration Board.
3.	A. Mbura	French & Hastings
4.	A. Mwakatumbula	Standard Chartered Bank (T) Limited
5.	A. Mwashalla	GMP Architects
6.	A. Sykes	Sykes Insurance Consultants Limited
7.	B. Chagula	Norplan A/S
8.	D. Mawalla	MD Consultancy
9.	D. Mwabuki	Hifab International (T) Branch
10.	E. Lipambila	Envirolink Architects Limited
11.	E. Moshi	EZM Architects & Associates
12.	E. Mushi	Norplan A/S
13.	E. Rubaratuka	University of Dar es Salaam
14.	G. Punjani	Apartment Hotels Limited
15.	H. Karim	Allied Estates Limited
16.	J. Arato	Arqes Africa (K)
17.	J. Kalwera	A & P Consultants
18.	J. Noronha	Covell Matthews Partnership
19.	L. Bulamile	University College of Lands & Architectural Studies
20.	L. Klerru	M.D. Consultancy
21.	L. Peter	University College of Lands & Architectural Studies
22.	M. Moshi	Anaeli Rindi Associates.
23.	M. Sumar	Sumar Varma Associates
24.	N. Inyangete	Landplan Icon Architects Limited
25.	P. Mwakio	Symbion International (T) Limited

26.	R. Matolo	Tanzania National Parks
27.	R. Rutahoile	R.R. Associates
28.	S. Marwa	Ministry of Finance
29.	S. Mpapasingo	Dar es Salaam City Commission.
30.	T. Kessy	Planned Development Limited
31.	V. Benne	Arusha Municipal Council

Appendix VI

Results of Clients' Priorities Survey

IPS BUILDING
By A.S. Hilma
4/10/1999

A Timing	How important is early completion to the success of your project?	Crucial ✓
		Important
		Not as important as other factors
B Controllable variation	Do you foresee the need to alter the project in any way once it has begun on site, for example to update machinery layouts?	Yes
		Definitely not ✓
C Complexity	Does your building (as distinct from what goes in it) need to be technically advanced or highly serviced?	Yes
		Moderately so ✓
		No, just simple
D Quality level	What level of quality do you seek in the design and workmanship?	Basic competence
		Good but not special ✓
		Prestige
E Price certainty	Do you need to have a firm price for the project construction before you can commit it to proceed?	Yes ✓
		A target plus or minus will do
F Competition	Do you need to choose your construction team by price competition?	Certainly for all construction work ✓
		Construction and management teams
		No, other factors more important
GI Responsibility Division of	Can you manage separate consultancies and contractors, or do you want just one firm to be responsible after the briefing stage?	Can manage separate firms
		Must have only one firm for everything ✓
GII Responsibility Professional	Do you want direct professional responsibility to you from the designers and cost consultants?	Not important
		Yes ✓
H Risk avoidance	Do you want to pay someone to take the risk of cost and time slippage from you?	No, prefer to retain risk and therefore control
		Prepared to share agreed risks ✓
		Yes

	Traditional			Design and build		Management		Design and manage			
	Sequential	Accelerated	Direct	Competitive	Develop and construct	Management contracting	Construction management	Contractor project manager	Consultant project manager		
1		X	X			X	X	X	X	Crucial	A Timing
2		●	●	●	●	●	●	●	●	Important	
3	●									Not crucial	
4	●	●				●	●	●	●	Yes	B Controllable variation
5			X	X	X					No	
6	●	●				●	●	●	●	Yes	C Complexity
7		X	X	X	X	X	X	X		Moderately	
8			●	●						No	
9			●	●						Basic	D Quality level
10	X	X	X	X	X	X	X	X	X	Good	
11	●	●				●	●			Prestige	
12	X		X	X	X	X		X		Yes	E Price certainty
13		●					●		●	Target	
14	X			X	X	X	X	X	X	Construction	F Competition
15	●				●	●				Construction & management	
16		●	●							No	
17	●	●				●	●			Separate firms	GI Responsibility Division of
18			X	X	X			X	X	One firm only	
19			●	●	●			●		No	GII Responsibility Professional
20	X	X				X	X		X	Yes	
21							●		●	No	H Risk avoidance
22	X	X				X				Share	
23			●	●	●			●		Yes	
Totals	5	5	6	6	6	7	5	6	5		

Figure 4.2 Identifying your priorities (Turner, 1990)

A Timing	How important is early completion to the success of your project?	Crucial
		Important ✓
		Not as important as other factors
B Controllable variation	Do you foresee the need to alter the project in any way once it has begun on site, for example to update machinery layouts?	Yes
		Definitely not ✓
C Complexity	Does your building (as distinct from what goes in it) need to be technically advanced or highly serviced?	Yes
		Moderately so ✓
		No, just simple
D Quality level	What level of quality do you seek in the design and workmanship?	Basic competence
		Good but not special ✓
		Prestige
E Price certainty	Do you need to have a firm price for the project construction before you can commit it to proceed?	Yes
		A target plus or minus will do ✓
F Competition	Do you need to choose your construction team by price competition?	Certainly for all construction work
		Construction and management teams
		No, other factors more important ✓
GI Responsibility Division of	Can you manage separate consultancies and contractors, or do you want just one firm to be responsible after the briefing stage?	Can manage separate firms
		Must have only one firm for everything ✓
GII Responsibility Professional	Do you want direct professional responsibility to you from the designers and cost consultants?	Not important ✓
		Yes
H Risk avoidance	Do you want to pay someone to take the risk of cost and time slippage from you?	No, prefer to retain risk and therefore control
		Prepared to share agreed risks
		Yes ✓

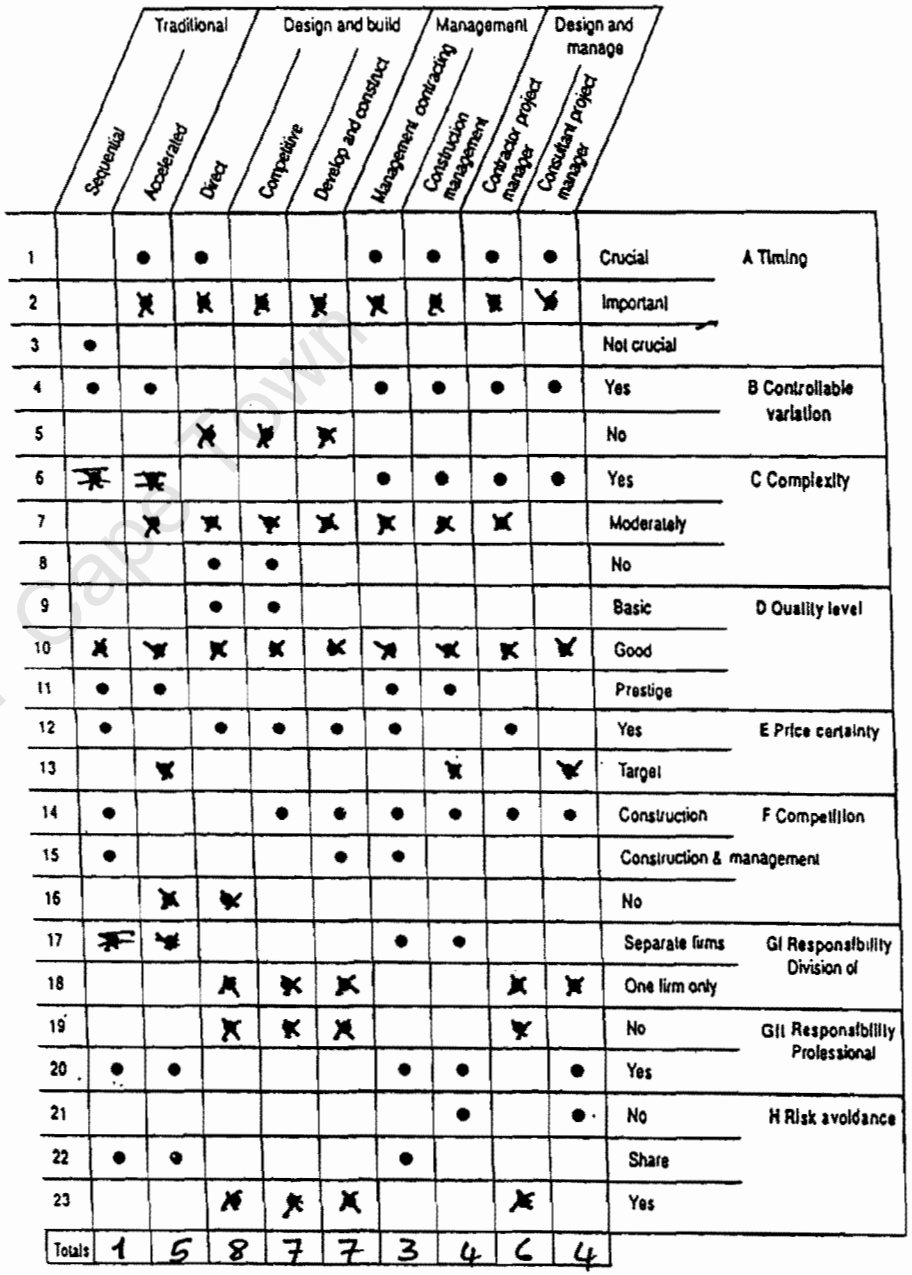

Figure 4.2 Identifying your priorities (Turner, 1990)

Eng. RJ Matoto

Signature removed

24.9.99, TANAPA

A Timing	How important is early completion to the success of your project?	Crucial ✓
		Important
		Not as important as other factors
B Controllable variation	Do you foresee the need to alter the project in any way once it has begun on site, for example to update machinery layouts?	Yes ✓
		Definitely not
C Complexity	Does your building (as distinct from what goes in it) need to be technically advanced or highly serviced?	Yes
		Moderately so ✓
		No, just simple
D Quality level	What level of quality do you seek in the design and workmanship?	Basic competence
		Good but not special ✓
		Prestige
E Price certainty	Do you need to have a firm price for the project construction before you can commit it to proceed?	Yes
		A target plus or minus will do ✓
F Competition	Do you need to choose your construction team by price competition?	Certainly for all construction work
		Construction and management teams
		No, other factors more important ✓
GI Responsibility Division of	Can you manage separate consultancies and contractors, or do you want just one firm to be responsible after the briefing stage?	Can manage separate firms ✓
		Must have only one firm for everything
GII Responsibility Professional	Do you want direct professional responsibility to you from the designers and cost consultants?	Not important
		Yes ✓
H Risk avoidance	Do you want to pay someone to take the risk of cost and time slippage from you?	No, prefer to retain risk and therefore control
		Prepared to share agreed risks
		Yes ✓

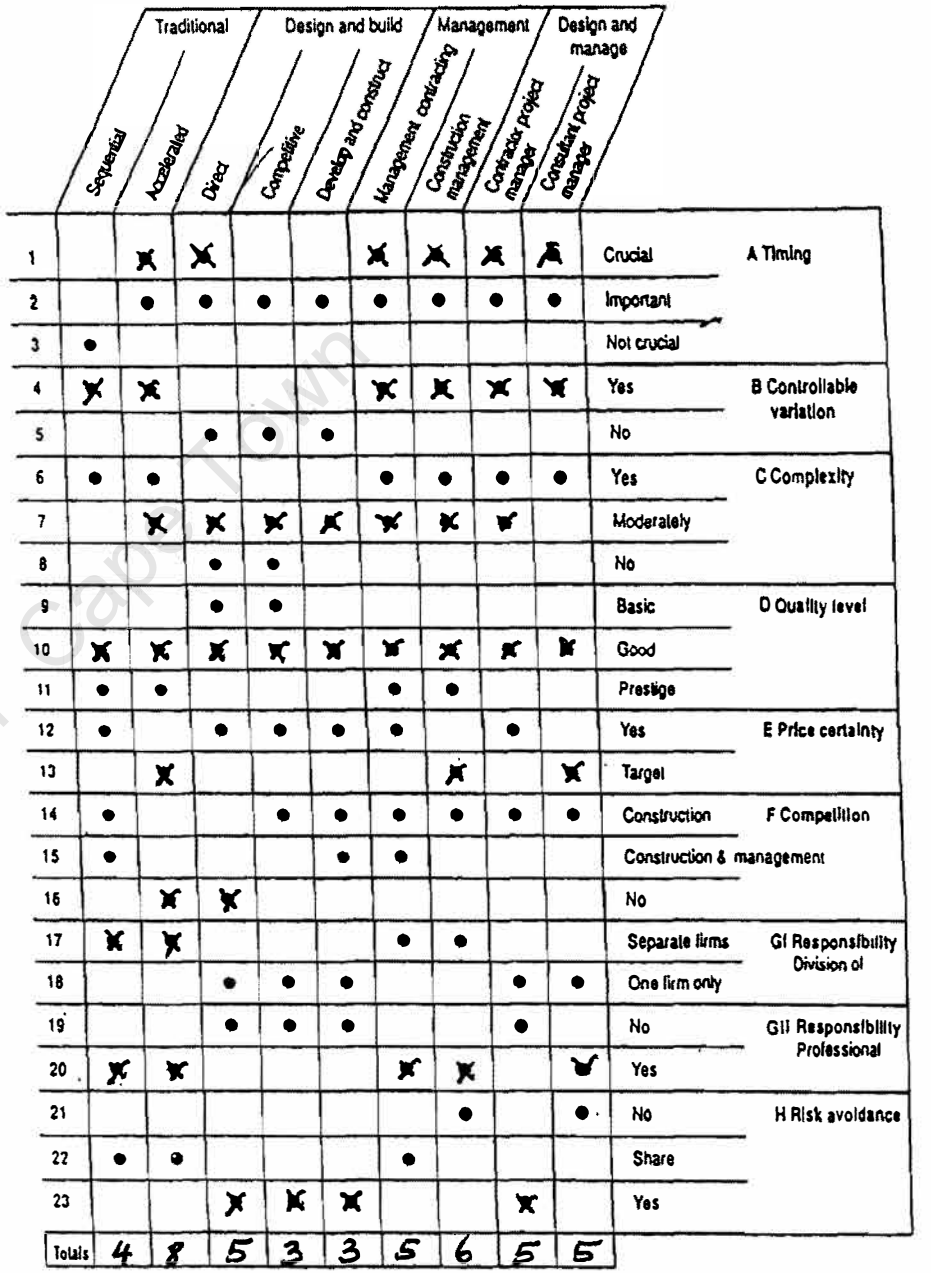

Figure 4.2 Identifying your priorities (Turner, 1990)

PPT TOWER

By: A. S. KILIMA

4/10/1999

A Timing	How important is early completion to the success of your project?	Crucial	✓
		Important	
		Not as important as other factors	
B Controllable variation	Do you foresee the need to alter the project in any way once it has begun on site, for example to update machinery layouts?	Yes	✓
		Definitely not	
C Complexity	Does your building (as distinct from what goes in it) need to be technically advanced or highly serviced?	Yes	✓
		Moderately so	
		No, just simple	
D Quality level	What level of quality do you seek in the design and workmanship?	Basic competence	
		Good but not special	
		Prestige	✓
E Price certainty	Do you need to have a firm price for the project construction before you can commit it to proceed?	Yes	✓
		A target plus or minus will do	
F Competition	Do you need to choose your construction team by price competition?	Certainly for all construction work	✓
		Construction and management teams	
		No, other factors more important	
GI Responsibility Division of	Can you manage separate consultancies and contractors, or do you want just one firm to be responsible after the briefing stage?	Can manage separate firms	
		Must have only one firm for everything	✓
GII Responsibility Professional	Do you want direct professional responsibility to you from the designers and cost consultants?	Not important	
		Yes	✓
H Risk avoidance	Do you want to pay someone to take the risk of cost and time slippage from you?	No, prefer to retain risk and therefore control	
		Prepared to share agreed risks	
		Yes	✓

	Traditional			Design and build		Management		Design and manage			
	Sequential	Accelerated	Direct	Competitive	Develop and construct	Management contracting	Construction management	Contractor project manager	Consultant project manager		
1		X	X			X	X	X	X	Crucial	A Timing
2		●	●	●	●	●	●	●	●	Important	
3	●									Not crucial	
4	X	X				X	X	X	X	Yes	B Controllable variation
5			●	●	●					No	
6	X	X				X	X	X	X	Yes	C Complexity
7		●	●	●	●	●	●	●		Moderately	
8			●	●						No	
9			●	●						Basic	D Quality level
10	●	●	●	●	●	●	●	●	●	Good	
11	X	X				X	X			Prestige	
12	X		X	X	X	X		X		Yes	E Price certainty
13		●					●		●	Target	
14	X			X	X	X	X	X	X	Construction	F Competition
15	●				●	●				Construction & management	
16		●	●							No	
17	●	●				●	●			Separate firms	GI Responsibility Division of
18			X	X	X			X	X	One firm only	
19			●	●	●			●		No	GII Responsibility Professional
20	X	X				X	X		X	Yes	
21							●		●	No	H Risk avoidance
22	●	●				●				Share	
23			X	X	X			X		Yes	
Totals	6	5	4	4	4	7	6	7	6		

Figure 4.2 Identifying your priorities (Turner, 1990)

STANDARD CHARTERED BANK.

A Timing	How important is early completion to the success of your project?	Crucial ✓
		Important
		Not as important as other factors
B Controllable variation	Do you foresee the need to alter the project in any way once it has begun on site, for example to update machinery layouts?	Yes
		Definitely not ✓
C Complexity	Does your building (as distinct from what goes in it) need to be technically advanced or highly serviced?	Yes
		Moderately so ✓
		No, just simple
D Quality level	What level of quality do you seek in the design and workmanship?	Basic competence
		Good but not special
		Prestige ✓
E Price certainty	Do you need to have a firm price for the project construction before you can commit it to proceed?	Yes ✓
		A target plus or minus will do
F Competition	Do you need to choose your construction team by price competition?	Certainly for all construction work
		Construction and management teams ✓
		No, other factors more important
GI Responsibility Division of	Can you manage separate consultancies and contractors, or do you want just one firm to be responsible after the briefing stage?	Can manage separate firms ✓
		Must have only one firm for everything
GII Responsibility Professional	Do you want direct professional responsibility to you from the designers and cost consultants?	Not important
		Yes ✓
H Risk avoidance	Do you want to pay someone to take the risk of cost and time slippage from you?	No, prefer to retain risk and therefore control
		Prepared to share agreed risks ✓
		Yes

	Traditional			Design and build			Management			Design and manage			
	Sequential	Accelerated	Direct	Competitive	Develop and construct	Management contracting	Construction management	Contractor project manager	Consultant project manager				
1		X	X			X	X	X	X	Crucial	A Timing		
2		●	●	●	●	●	●	●	●	Important			
3	●									Not crucial			
4	●	●				●	●	●	●	Yes	B Controllable variation		
5			X	X	X					No			
6	●	●				●	●	●	●	Yes	C Complexity		
7		X	X	X	X	X	X	X		Moderately			
8			●	●						No			
9			●	●						Basic	D Quality level		
10	●	●	●	●	●	●	●	●	●	Good			
11	X	X				X	X			Prestige			
12	X		X	X	X	X		X		Yes	E Price certainty		
13		●					●		●	Target			
14	●			●	●	●	●	●	●	Construction	F Competition		
15	X				X	X				Construction & management			
16		●	●							No			
17	X	X				X	X			Separate firms	GI Responsibility Division of		
18			●	●	●			●	●	One firm only			
19			●	●	●			●		No	GII Responsibility Professional		
20	●	●				●	●		●	Yes			
21							X		X	No	H Risk avoidance		
22	X	X				X				Share			
23			●	●	●			●		Yes			
Totals	5	5	4	3	4	7	5	3	2				

Figure 4.2 Identifying your priorities (Turner, 1990)

SUKAIN VILLAS

			Traditional		Design and build			Management		Design and manage			
			Sequential	Accelerated	Direct	Competitive	Develop and construct	Management contracting	Construction management	Contractor project manager	Consultant project manager		
A Timing	How important is early completion to the success of your project?	Crucial		●	●			●	●	●	●	Crucial	A Timing
		Important ✓ (cost also important)		✕	✕	✕	✕	✕	✕	✕	✕	Important	
		Not as important as other factors	●									Not crucial	
B Controllable variation	Do you foresee the need to alter the project in any way once it has begun on site, for example to update machinery layouts?	Yes ✓ (if important enough)	✕	✕				✕	✕	✕	✕	Yes	B Controllable variation
		Definitely not			●	●	●					No	
C Complexity	Does your building (as distinct from what goes in it) need to be technically advanced or highly serviced?	Yes	●	●				●	●	●	●	Yes	C Complexity
		Moderately so ✓		✕	✕	✕	✕	✕	✕	✕		Moderately	
		No, just simple			●	●						No	
D Quality level	What level of quality do you seek in the design and workmanship?	Basic competence			●	●						Basic	D Quality level
		Good but not special	●	●	●	●	●	●	●	●	●	Good	
		Prestige ✓	✕	✕				✕	✕			Prestige	
E Price certainty	Do you need to have a firm price for the project construction before you can commit it to proceed?	Yes	●		●	●	●	●		●		Yes	E Price certainty
		A target plus or minus will do ✓		✕					✕		✕	Target	
F Competition	Do you need to choose your construction team by price competition?	Certainly for all construction work ✓	✕			✕	✕	✕	✕	✕	✕	Construction	F Competition
		Construction and management teams	●				●	●				Construction & management	
		No, other factors more important		●	●							No	
GI Responsibility Division of	Can you manage separate consultancies and contractors, or do you want just one firm to be responsible after the briefing stage?	Can manage separate firms ✓	✕	✕				✕	✕			Separate firms	GI Responsibility Division of
		Must have only one firm for everything			●	●	●			●	●	One firm only	
GII Responsibility Professional	Do you want direct professional responsibility to you from the designers and cost consultants?	Not important			●	●	●			●		No	GII Responsibility Professional
		Yes ✓	✕	✕				✕	✕		✕	Yes	
H Risk avoidance	Do you want to pay someone to take the risk of cost and time slippage from you?	No, prefer to retain risk and therefore control							●		●	No	H Risk avoidance
		Prepared to share agreed risks ✓	✕	✕				✕				Share	
		Yes			●	●	●			●		Yes	
		Totals	6	8	2	3	3	8	8	4	5		

(good answers)

Figure 4.2 Identifying your priorities (Turner, 1990)

Kijende Housing Estate

A Timing	How important is early completion to the success of your project?	Crucial ✓
		Important
		Not as important as other factors
B Controllable variation	Do you foresee the need to alter the project in any way once it has begun on site, for example to update machinery layouts?	Yes
		Definitely not ✓
C Complexity	Does your building (as distinct from what goes in it) need to be technically advanced or highly serviced?	Yes
		Moderately so ✓
		No, just simple
D Quality level	What level of quality do you seek in the design and workmanship?	Basic competence
		Good but not special
		Prestige ✓
E Price certainty	Do you need to have a firm price for the project construction before you can commit it to proceed?	Yes ✓
		A target plus or minus will do
F Competition	Do you need to choose your construction team by price competition?	Certainly for all construction work ✓
		Construction and management teams
		No, other factors more important
GI Responsibility Division of	Can you manage separate consultancies and contractors, or do you want just one firm to be responsible after the briefing stage?	Can manage separate firms
		Must have only one firm for everything ✓
GII Responsibility Professional	Do you want direct professional responsibility to you from the designers and cost consultants?	Not important
		Yes ✓
H Risk avoidance	Do you want to pay someone to take the risk of cost and time slippage from you?	No, prefer to retain risk and therefore control
		Prepared to share agreed risks ✓
		Yes

	Traditional			Design and build		Management			Design and manage			
	Sequential	Accelerated	Direct	Competitive	Develop and construct	Management contracting	Construction management	Contractor project manager	Consultant project manager			
1		X	X			X	X	X	X	Crucial	A Timing	
2		•	•	•	•	•	•	•	•	Important		
3	•									Not crucial		
4	•	•				•	•	•	•	Yes	B Controllable variation	
5			X	X	X					No		
6	•	•				•	•	•	•	Yes	C Complexity	
7		X	X	X	X	X	X	X		Moderately		
8			•	•						No		
9			•	•						Basic	D Quality level	
10	•	•	•	•	•	•	•	•	•	Good		
11	X	X				X	X			Prestige		
12	X		X	X	X	X		X		Yes	E Price certainty	
13		•					•		•	Target		
14	X			X	X	X	X	X	X	Construction	F Competition	
15	•				•	•				Construction & management		
16		•	•							No		
17	•	•				•	•			Separate firms	GI Responsibility Division of	
18			X	X	X			X	X	One firm only		
19			•	•	•			•		No	GII Responsibility Professional	
20	X	X				X	X		X	Yes		
21							•		•	No	H Risk avoidance	
22	X	X				X				Share		
23			•	•	•			•		Yes		
Totals	5	5	5	5	5	7	5	5	4			

Figure 4.2 Identifying your priorities (Turner, 1990)

PROPOSED TREASURY ANNEX BUILDING AND VERTICAL EXTENSION TO CTB BUILDING.

A Timing	How important is early completion to the success of your project?	Crucial ✓
		Important
		Not as important as other factors
B Controllable variation	Do you foresee the need to alter the project in any way once it has begun on site, for example to update machinery layouts?	Yes ✓
		Definitely not
C Complexity	Does your building (as distinct from what goes in it) need to be technically advanced or highly serviced?	Yes ✓
		Moderately so
		No, just simple
D Quality level	What level of quality do you seek in the design and workmanship?	Basic competence
		Good but not special
		Prestige ✓
E Price certainty	Do you need to have a firm price for the project construction before you can commit it to proceed?	Yes
		A target plus or minus will do ✓
F Competition	Do you need to choose your construction team by price competition?	Certainly for all construction work
		Construction and management teams ✓
		No, other factors more important
GI Responsibility Division of	Can you manage separate consultancies and contractors, or do you want just one firm to be responsible after the briefing stage?	Can manage separate firms ✓
		Must have only one firm for everything
GII Responsibility Professional	Do you want direct professional responsibility to you from the designers and cost consultants?	Not important
		Yes ✓
H Risk avoidance	Do you want to pay someone to take the risk of cost and time slippage from you?	No, prefer to retain risk and therefore control
		Prepared to share agreed risks ✓
		Yes

Figure 4.2 Identifying your priorities (Turner, 1990)

	Traditional			Design and build			Management			Design and manage			
	Sequential	Accelerated	Direct	Competitive	Develop and construct	Management contracting	Construction management	Contractor project manager	Consultant project manager				
1		X	X			X	X	X	X	Crucial	A Timing		
2		•	•	•	•	•	•	•	•	Important			
3	•									Not crucial			
4	X	X				X	X	X	X	Yes	B Controllable variation		
5			•	•	•					No			
6	X	X				X	X	X	X	Yes	C Complexity		
7		•	•	•	•	•	•	•		Moderately			
8			•	•						No			
9			•	•						Basic	D Quality level		
10	•	•	•	•	•	•	•	•	•	Good			
11	X	X				X	X			Prestige			
12	•		•	•	•	•		•		Yes	E Price certainty		
13		X					X		X	Target			
14	•			•	•	•	•	•	•	Construction	F Competition		
15	X				X	X				Construction & management			
16		•	•							No			
17	X	X				X	X			Separate firms	GI Responsibility Division of		
18			•	•	•			•	•	One firm only			
19			•	•	•			•		No	GII Responsibility Professional		
20	X	X				X	X		•	Yes			
21							•		•	No	H Risk avoidance		
22	X	X				X				Share			
23			•	•	•			•		Yes			
Totals	7	8	1		1	8	7	3	4				

A Timing	How important is early completion to the success of your project?	Crucial
		Important
		Not as important as other factors
B Controllable variation	Do you foresee the need to alter the project in any way once it has begun on site, for example to update machinery layouts?	Yes
		Definitely not
C Complexity	Does your building (as distinct from what goes in it) need to be technically advanced or highly serviced?	Yes
		Moderately so
		No, just simple
D Quality level	What level of quality do you seek in the design and workmanship?	Basic competence
		Good but not special
		Prestige
E Price certainty	Do you need to have a firm price for the project construction before you can commit it to proceed?	Yes
		A target plus or minus will do
F Competition	Do you need to choose your construction team by price competition?	Certainly for all construction work
		Construction and management teams
		No, other factors more important
GI Responsibility Division of	Can you manage separate consultancies and contractors, or do you want just one firm to be responsible after the briefing stage?	Can manage separate firms
		Must have only one firm for everything
GII Responsibility Professional	Do you want direct professional responsibility to you from the designers and cost consultants?	Not important
		Yes
H Risk avoidance	Do you want to pay someone to take the risk of cost and time slippage from you?	No, prefer to retain risk and therefore control
		Prepared to share agreed risks
		Yes

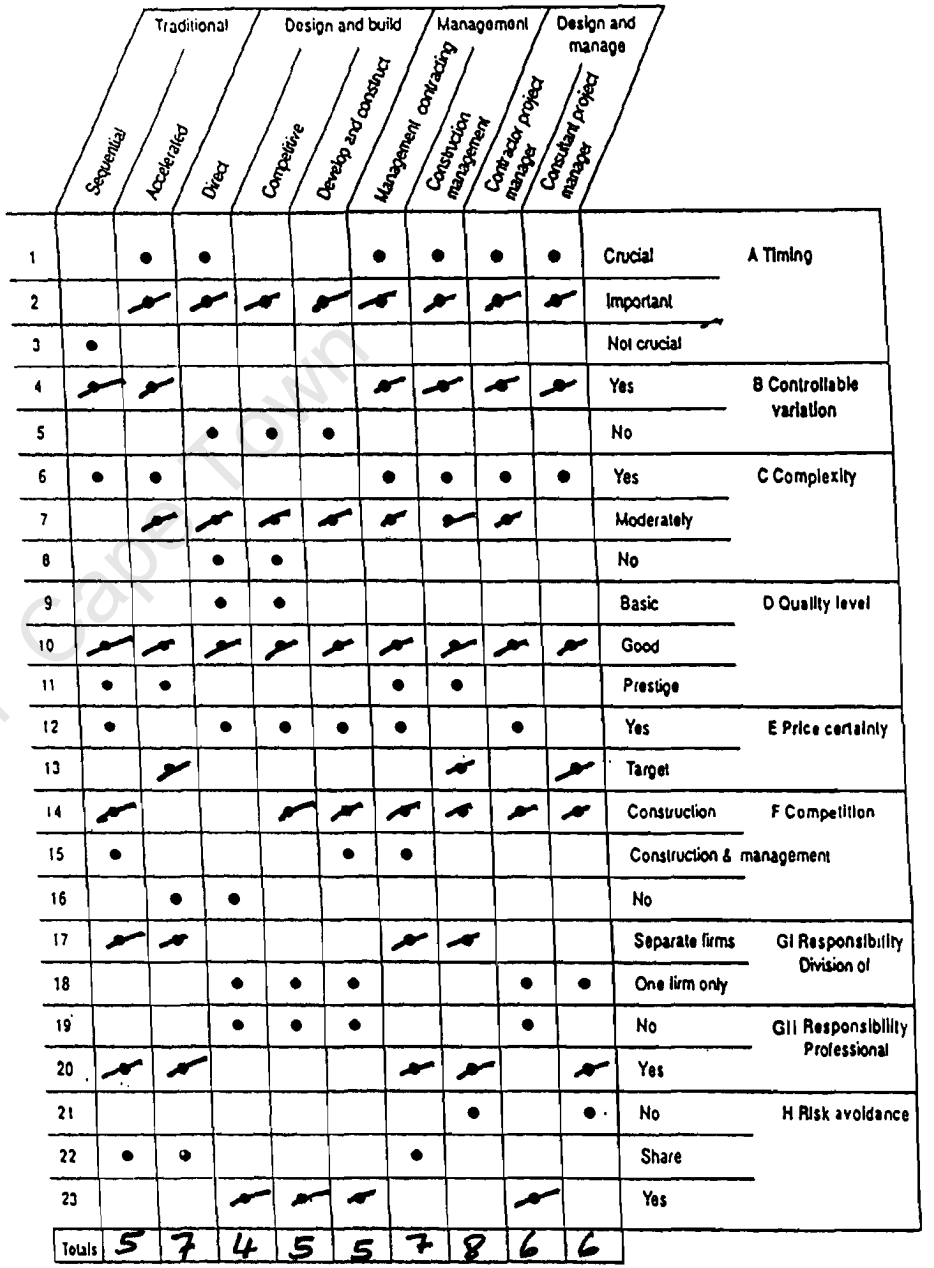

Figure 4.2 Identifying your priorities (Turner, 1990)

A Timing	How important is early completion to the success of your project?	Crucial
		Important ✓
		Not as important as other factors
B Controllable variation	Do you foresee the need to alter the project in any way once it has begun on site, for example to update machinery layouts?	Yes ✓
		Definitely not
C Complexity	Does your building (as distinct from what goes in it) need to be technically advanced or highly serviced?	Yes
		Moderately so ✓
		No, just simple
D Quality level	What level of quality do you seek in the design and workmanship?	Basic competence
		Good but not special ✓
		Prestige
E Price certainty	Do you need to have a firm price for the project construction before you can commit it to proceed?	Yes ✓
		A target plus or minus will do
F Competition	Do you need to choose your construction team by price competition?	Certainly for all construction work
		Construction and management teams ✓
		No, other factors more important
GI Responsibility Division of	Can you manage separate consultancies and contractors, or do you want just one firm to be responsible after the briefing stage?	Can manage separate firms ✓
		Must have only one firm for everything
GII Responsibility Professional	Do you want direct professional responsibility to you from the designers and cost consultants?	Not important
		Yes ✓
H Risk avoidance	Do you want to pay someone to take the risk of cost and time slippage from you?	No, prefer to retain risk and therefore control
		Prepared to share agreed risks ✓
		Yes ✓

	Traditional			Design and build			Management			Design and manage			
	Sequential	Accelerated	Direct	Competitive	Develop and construct	Management contracting	Construction management	Contractor project manager	Consultant project manager				
1		●	●			●	●	●	●	Crucial	A Timing		
2		✓	✓	✓	✓	✓	✓	✓	✓	Important			
3	●									Not crucial			
4	✓	✓				✓	✓	✓	✓	Yes	B Controllable variation		
5			●	●	●					No			
6	●	●				●	●	●	●	Yes	C Complexity		
7		✓	✓	✓	✓	✓	✓	✓		Moderately			
8			●	●						No			
9			●	●						Basic	D Quality level		
10	✓	✓	✓	✓	✓	✓	✓	✓	✓	Good			
11	●	●				●	●			Prestige			
12	✓		✓	✓	✓	✓		✓		Yes	E Price certainty		
13		●					●		●	Target			
14	●			●	●	●	●	●	●	Construction	F Competition		
15	✓				✓	✓				Construction & management			
16		●	●							No			
17	✓	✓				✓	✓			Separate firms	GI Responsibility Division of		
18			●	●	●			●	●	One firm only			
19			●	●	●			●		No	GII Responsibility Professional		
20	✓	✓				✓	✓		✓	Yes			
21							●		●	No	H Risk avoidance		
22	✓	✓				✓				Share			
23			●	●	●			●		Yes			
Totals	7	7	4	4	5	9	6	5	4				

Figure 4.2 Identifying your priorities (Turner, 1990)

APPENDIX VII

UNIVERSITY OF CAPE TOWN

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12 August, 1999

Dear Sir/Madam

RE: **LETTER OF INTRODUCTION OF MR. A.M. KAMALA**

This is to confirm that Mr. A.M. Kamala is a postgraduate student studying for a MSc. Degree in Construction Economics and Management. Mr. Kamala who has directed a questionnaire to you is doing a research paper titled "*Proliferation of Different Building Procurement Systems and Their Appropriate Applications: A Case of Tanzania*".

I therefore request that you grant the above-mentioned student your assistance in providing the information that he may require.

Yours sincerely

Signature removed

Professor B.G. Boaden
Programme Director